

MOTOR AGE

JUL 12 1940

A CHILTON PUBLICATION

DEVOTED TO THE INTERESTS OF THE INDEPENDENT SERVICE STATION



The ultra-fast speedway camera catches Betty Middleton in the saddle on the hood of one of Jimmy Lynch's cars as it hurdles through a paper hoop at 55 m.p.h. This modern gasoline version of the bucking broncho stunt keeps spectators agog at the 1940 New York World's Fair

JULY
1940



A "BEST SELLER" BY HASTINGS THAT SWEEPS THE NATION

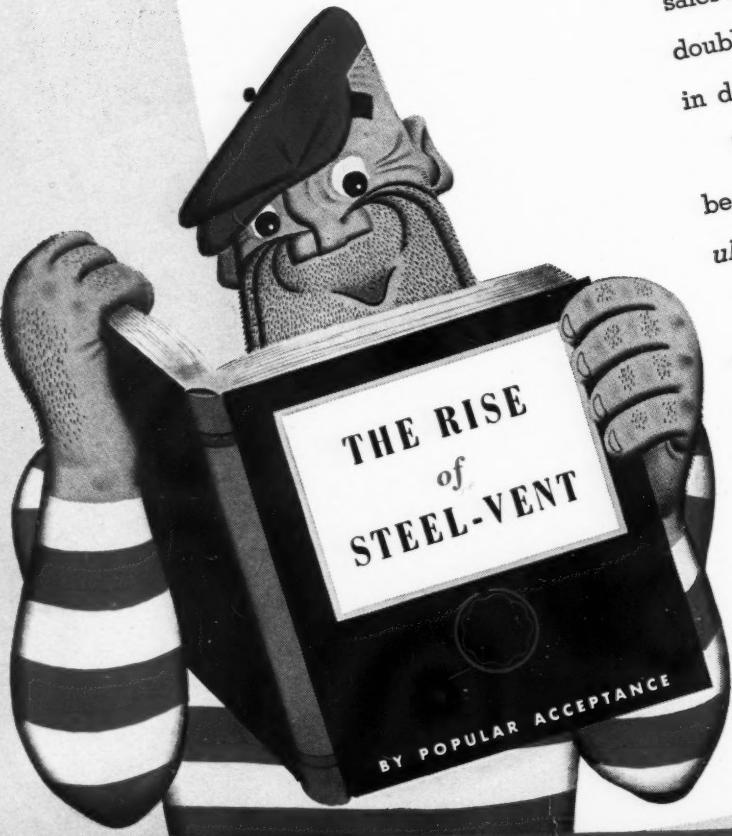
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The trade likes Steel-Vent because it's the answer to a long-felt need . . . one ring for all jobs, from rebores to .025 tapers.

HASTINGS MANUFACTURING COMPANY, HASTINGS, MICH.
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U. S. Patent No. 2,148,997. A. T. S., App.

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"P.S." P.S. to PUSH SALES



P.S. campaign

Here's how it's done by thousands of service organizations from Maine to California—they use reprints of Collier's P.S. spreads for mailing and displays!

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Remember, automotive advertisers in Collier's are giving you the finest support. They are giving you advertising where it counts most.

For your part, mail Collier's Preventive Service reprints to your customer and prospect list and get your share of the new business created by this campaign.

Six installments of P.S. have already appeared in Collier's. You can get reprints of the latest—"Start Your Own Safety Drive With Preventive Service"—while they last! For particulars, write Preventive Service, Collier's, 250 Park Avenue, New York City.

(Lower left) . . . Lyndale Tire & Automotive Co., Minneapolis, Minn.

(Upper right) . . . Esso Servicenter, Baltimore, Md.

(Lower right) . . . Howard and Fremont Service, San Francisco, Calif.

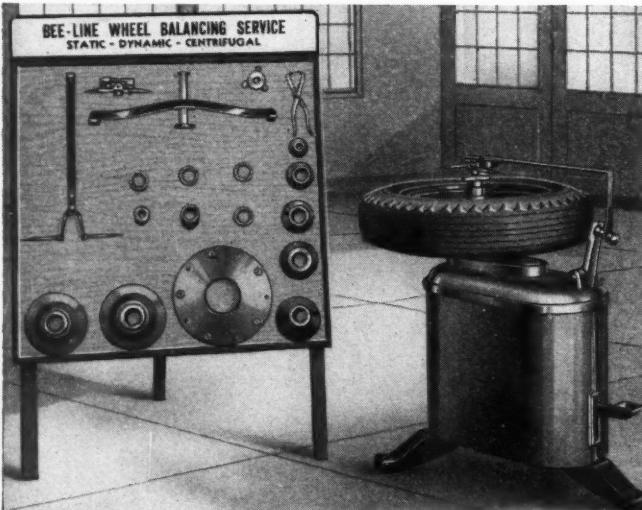
(Upper left) . . . Grosse Point Central Service, Grosse Point, Mich.



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now ready.

Members by invitation . . . Rice Leaders of the World Assn.

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BEE-LINE COMPANY Dept. MA6 Davenport, Iowa

MOTOR AGE

DEVOTED TO THE INTERESTS OF THE INDEPENDENT SERVICE STATION

Subscriptions for Motor Age are accepted only from independent repair shops and their employees.

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MOTOR AGE

JULY

1940

model A, he got twenty bucks. That's a lot of money for that class of car owner, but Ray got it and the car owners practically stood in line waiting their turn. You will note that I say got it and not gets it. The reason is that general business in Reading is shot.

Monkey Business

Walked into a funny piece of trouble the other day in Walt Harris' shop. He had a Studebaker that with a set throttle would keep changing its speed. The engine speed would go up and down, up and down. A change in speed of about 400 r.p.m. every second. After doing a lot of heavy standing around, we finally took the carburetor apart. Everything seemed to be in good shape, but when we buckled it up the trouble was gone. Maybe you can figure it out.

Arrangement

You'll probably remember the argument I had a couple of years ago with my friend Condit on how to time engines. Yesterday's mail brought a letter from my controversial friend asking if I still thought that the spark could be timed by means of a tachometer. And the answer is that I most emphatically do. If the engine pings after timing with a tach, to me it indicates that there is something wrong with the spark advance characteristics. Of course a dynamometer may probably do a better job, but not all of us have the price of a dynamometer.

Bill Toboek

Shop Talk

You're Out!

You can strike out in the business field as well as on the diamond if you haven't got what it takes. In baseball you have to be in good physical condition and you have to practice playing your position, fielding and batting. In addition, you have to know the game. In the automotive service field you'll surely strike out unless you know the game from all angles. Being able to do a good job of trouble shooting and then making the necessary repairs is a big portion of the job. But unless you are a good enough business man to keep jobs rolling into the shop you'll either get called out on strikes or get thrown out at first. It's a cinch you won't get a case of Wheaties. So study the business end of the game. Make sure that

you are doing everything possible in the way of advertising and display to keep the cars rolling into your shop.

Business

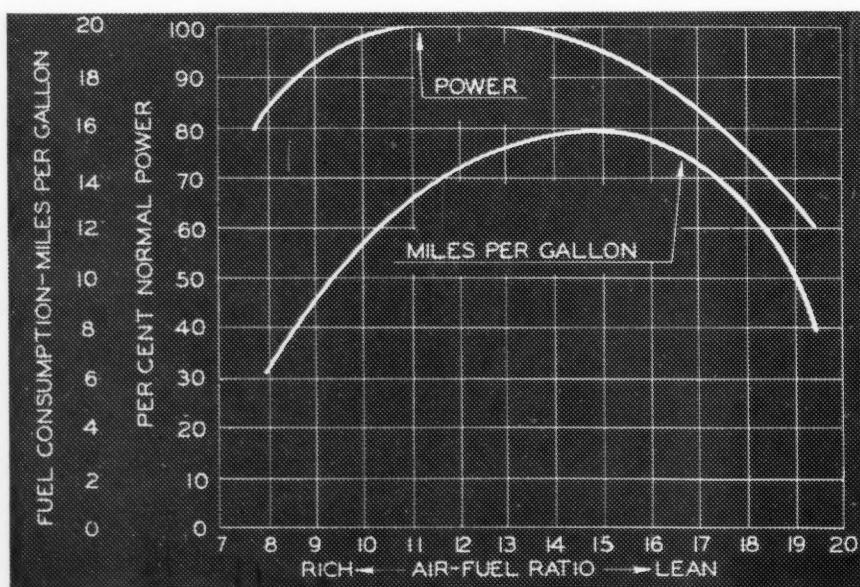
And speaking of business, Ray Landis, of Reading, Pa., stopped in the other day to say hello. Ray, to my mind, is one of the smartest operators in the business. In size, Ray's shop is small, but he certainly turns out the work. He is about the first man I ever met to use a vacuum gage. The most interesting thing about Ray's business is that while other shops were running around in circles cutting each other's throats, Ray was getting five bucks a cylinder for a carbon and valve job. That meant that on a model T or a

SQUEEZING OUT AN EXTRA MILE

Getting another mile or two out of the engine is a job for the fellow who knows just where to squeeze. Here are some hints on excessive gasoline consumption

By BOB HANKINSON

Chart showing air-fuel ratio and its relation to maximum power output and economy. Note that ratio of between 12.5 and 13 provides maximum power but not most economical fuel consumption. An adjustment providing greatest miles-per-gallon calls for slight sacrifice in general performance.



ONE of the hardest complaints the service manager has to handle is that of excessive gasoline consumption, chiefly because no two operators drive alike. The man behind the wheel has as much to do with gasoline consumption as any mechanical adjustment of his car.

The natural inclination of the mechanic is to blame the carburetor for the poor mileage when actually other parts of the engine may be more at fault. Rings, valves, ignition timing, manifold gaskets, manifold heat control valve, exhaust system, brakes, tire pressure—all have to be considered as well as the carburetor when making a thorough investigation of complaints of excessive gasoline consumption.

Without disassembling the carburetor and making flow tests of the various jets and passages, the average service station has only one method of checking the performance of the unit and that is with a combustion analyzer and, of course, the results recorded on the analyzer reflect conditions other than those directly connected with the carburetor. The carburetor, therefore, is usually the last unit to be checked in complaints of this kind.

First of all, a compression test of each cylinder should be made to determine the equality of compression. If one or more cylinders are weak, naturally the mixture ratio delivered by the carburetor would have to be richer than otherwise necessary to compensate for this weakness by increasing the power output of the other cylinders. If the test shows a variation of more than five pounds between cylinders, this condition should be corrected before further attempts at correction of the original complaint are made.



This variation may be due to worn or broken piston rings, allowing excessive blow-by, or to warped or poorly seated valves, or to a broken cylinder head gasket.

Air leaks at the intake manifold contribute to excessive gasoline consumption because the carburetor adjustment has to be over-rich to compensate for the additional supply of air. These leaks can be detected by squirting a little gasoline around the manifold flange and observing the action of the engine.

Spark plugs are also an important factor. The slogan by a well-known spark plug manufacturer that worn plugs waste one gallon of gasoline out of every ten is not just a good slogan—it is an established fact that worn plugs do cause incomplete combustion and therefore waste gasoline. They should be carefully cleaned and tested, and electrodes properly spaced. If the electrodes are worn or the insulator chipped or cracked the plugs should be replaced.

Gapping the spark plug electrodes is particularly important in order to obtain a spark that will insure complete combustion. In some cases it is possible to increase the spark plug gap and by so doing increase the gasoline mileage noticeably. Such an increase would have to be worked out progressively by test, however, as too great a gap will result in a tendency to miss under a hard pull or at sustained high speeds.

The operation of the distributor
(Continued on page 48)

1. After removing the cover and shifter assembly, place the transmission in two gears at once and remove the universal joint retaining cap screw and lock washer. Slide the universal joint and spacer off the mainshaft.

2. Remove the four clutch gear bearing retainer screws and shakeproof washers. Remove the retainer. Pull the clutch gear and bearing from the case by means of the special puller. Remove the 14 needle bearings from the inside of the clutch gear.

3. With a special puller, force the mainshaft out of the rear bearing and then remove the mainshaft through the front of the case. Shift the second speed gear into the clutch sleeve. Remove the clutch sleeve assembly, first and reverse sliding gear and the second speed gear from the case as a single assembly. Remove the second speed gear thrust washer from the case.

4. Expand the rear bearing lock ring into the case by means of an expand-



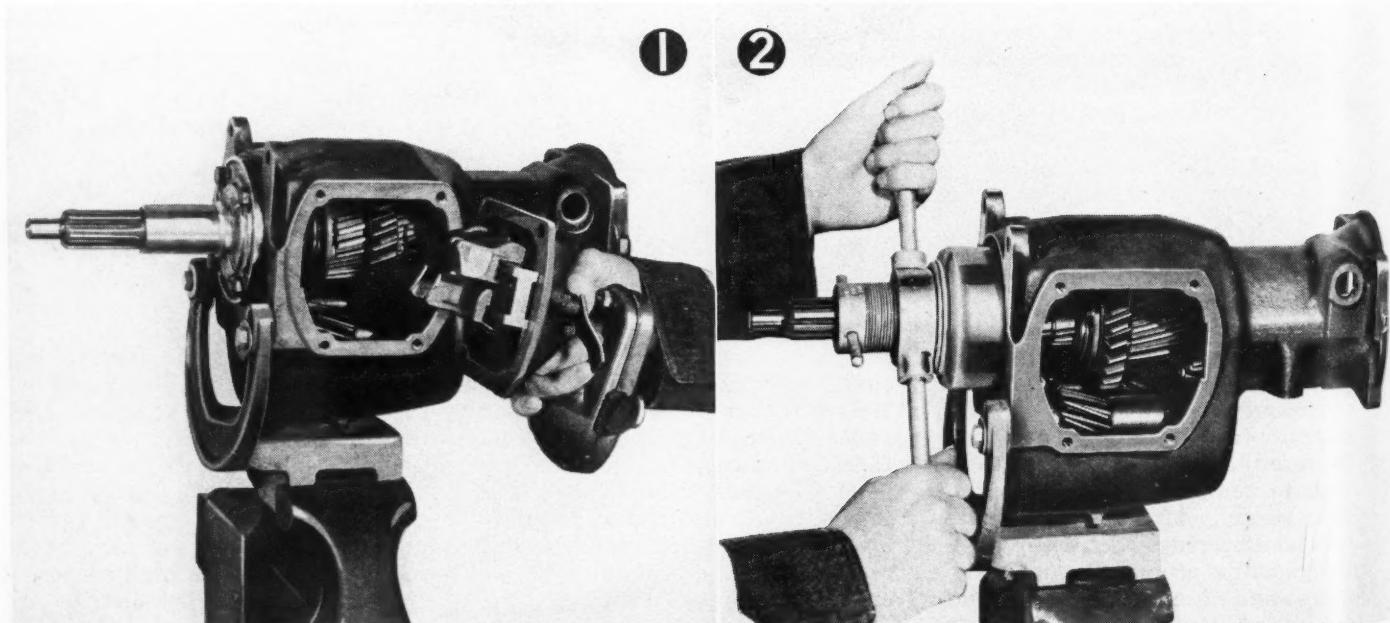
reverse idler shaft expansion plug from the inside of the case, using a hook-nosed punch. Drive the idler-shaft lock pin into the shaft and remove the shaft.

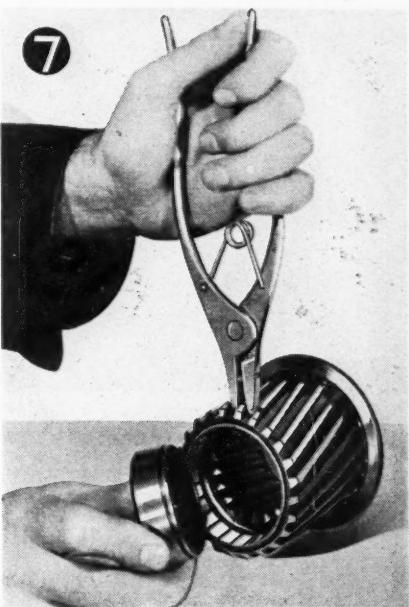
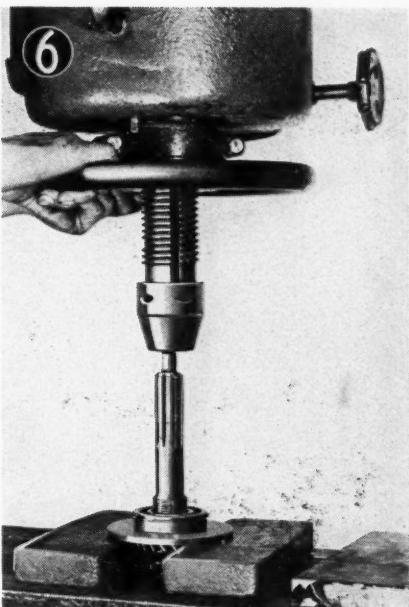
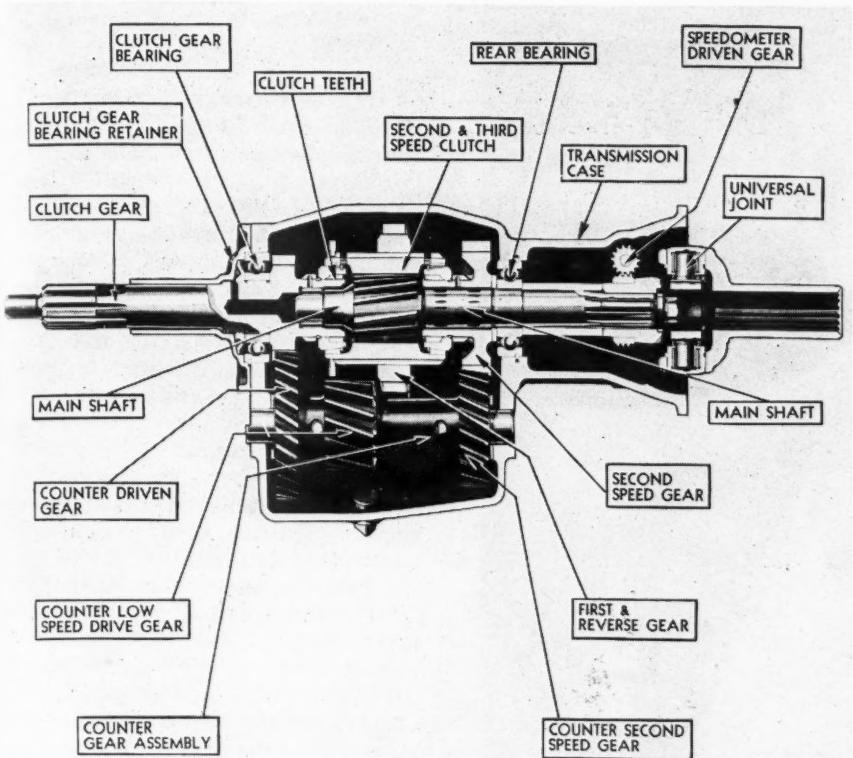
5. To disassemble the clutch gear, place it in a vise and remove the bearing retaining nut and oil slinger. The retaining nut and oil slinger is a one-piece die-casting with a left hand thread and is locked in place on the clutch gear shaft by being stacked into a hole.

6. Press the shaft out of the bearing. Do not drive out as the bearing will be damaged.

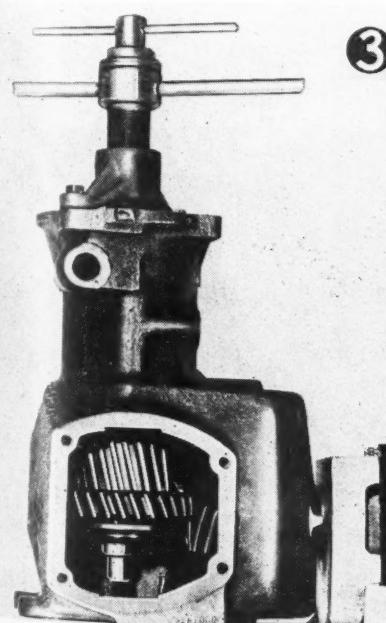
7. To disassemble the clutch sleeve, remove the second speed gear and the first and reverse sliding gear. Turn the synchronizing ring in the clutch sleeve until the ends of the ring retainers can be seen through the slot in the clutch sleeve. Using special pliers, expand the retainer into the counterbore in the clutch sleeve, which will permit the ring to slip out.

CHEVROLET TRANSMISSION

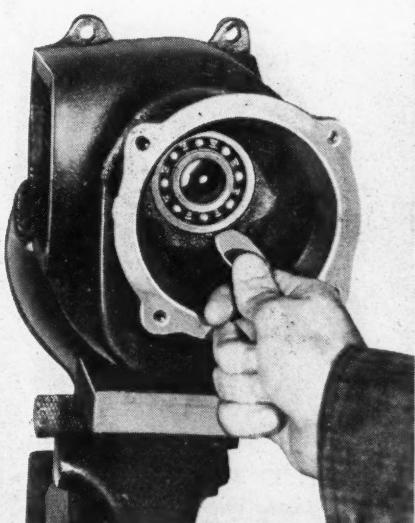




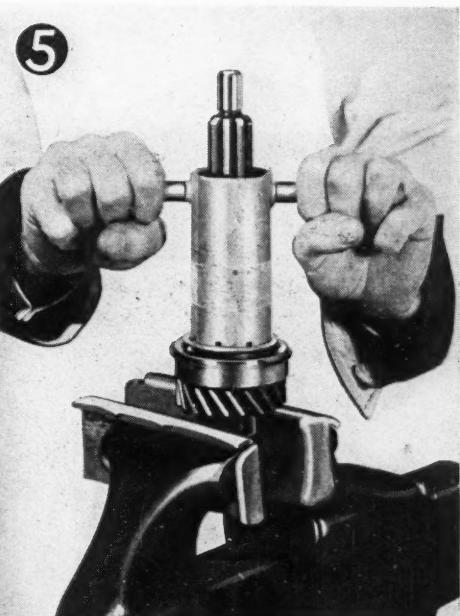
DISASSEMBLY



3 4



5





TWELVE years ago — April, 1928—the Motor Vehicle Inspection System was instituted in Pennsylvania, known as the "SAVE-A-LIFE" Campaign. This was sponsored by the Pennsylvania Automotive Association, a state-wide organization of car dealers, and was "voluntary." During that campaign, vehicles were inspected without charge, and the results were so astounding, that little difficulty was experienced in persuading State officials to recommend legislation, incorporating inspections as a permanent feature of the Pennsylvania Vehicle Code.

When the law became effective in 1929, the work of checking and supervising Inspection Stations was assigned to the Motor Patrol (now Pennsylvania Motor Police). Certain specific requirements were necessary for the appointment of stations and thousands of stations were assigned within a short period of time.

The responsibility of supervising stations was later turned over to private inspectors, and then real difficulties developed. Although in the early days, inspectors were probably sincere in their efforts, later, and particularly in

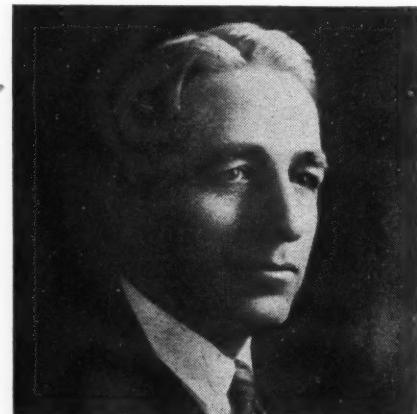
PENNA. RE-VITALIZES



William J. Hamilton
Pennsylvania Secretary of Revenue



T. E. Transeau
Director, Penna. Bureau of Highway
Safety



C. M. Wilhelm
Deputy, Pennsylvania Motor Police

recent years, "politics" was being played with the stations, and there was little enforcement of the protective features of the law. Highway safety suffered . . . a good tool was dulled. Almost any "hole in the wall" could get an appointment, regardless of lack of qualifications such as space, tools, equipment and trained personnel. It began to look as though inspections, with the resultant highway safety, would be discarded.

Laxity in inspection station regulation was due partly to the law, and partly to the method of handling. Under the law, revocation of appointment was optional, and there were various and repeated infractions of the law, and the rules governing stations, but with no penalty inflicted. In some cases, appointments were revoked as often as four times for a single station, merely to have the appointment reinstated. Violations included a "traveling" station—advertised in newspapers, as providing inspections on the street, for a small fee; mailing of stickers to friends; handing out a sticker with a five-gallon purchase of gasoline. No group was blameless—dealers, independent repair shops, fleet owners—many were guilty of

infractions of the old regulations.

Having fostered this law, and having been vitally interested in Motor Vehicle Equipment Inspections since its inception, the disintegration of the entire setup was a matter of grave concern to officials of the Pennsylvania Automotive Association, and at their annual convention in 1938, a committee was formed to study conditions, and endeavor to find a cure.

Conferences were held with state officials, and finally suggestions were presented for changes in the law—since adopted. Steps taken to effect the results which are already being felt, were:

1—Requested the Legislature (1939) to amend the Vehicle Code, making it mandatory—rather than optional to cancel any station violating the code, or Rules and Regulations laid down by the State. (Recommendation approved and became a law, Sept. 1, 1939.)

2—Requested the Legislature (1939) to provide in the Vehicle Code that owner, under certain conditions, was not responsible for mechanics' violation of Inspection Rules and Regulations. (Approved and became a law, Sept. 1, 1939.)

3—Suggested enforcement of

Inspection Law be transferred from Pennsylvania Department of Revenue to Pennsylvania Motor Police. (Transfer went into effect Sept. 1, 1939.)

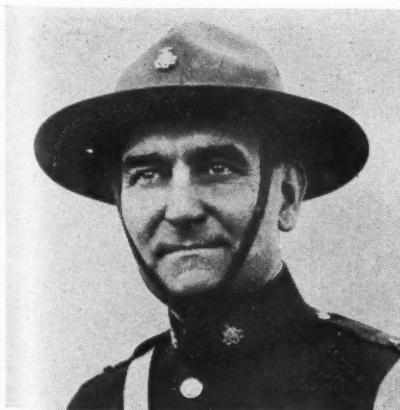
With these rather drastic changes came the necessity for a Campaign of Education and Enforcement, and assurance was given by state officials that the responsible departments are ready and willing to cooperate in an effort to raise the level of inspections.

The campaign involves the education of (a) enforcement officers, (b) inspection station operators and employees, and (c) the public.

Members of the Pennsylvania Motor Police assigned to investigating and supervising official stations have been instructed in their duties, and are well advanced in their part of the program. This group was called to Harrisburg and given actual demonstrations on proper method of inspections by expert mechanics, and at the open forums conducted, all phases of this work on which they were not clear, were fully explained.

While the task of checking offi-
(Continued on page 42)

ITS INSPECTION LAW



Lynn G. Adams
Commissioner, Pennsylvania Motor Police

State police, so efficient in enforcing 50-mile speed limit on Highways, now supervise and enforce the revised Motor Vehicle Equipment Inspection System

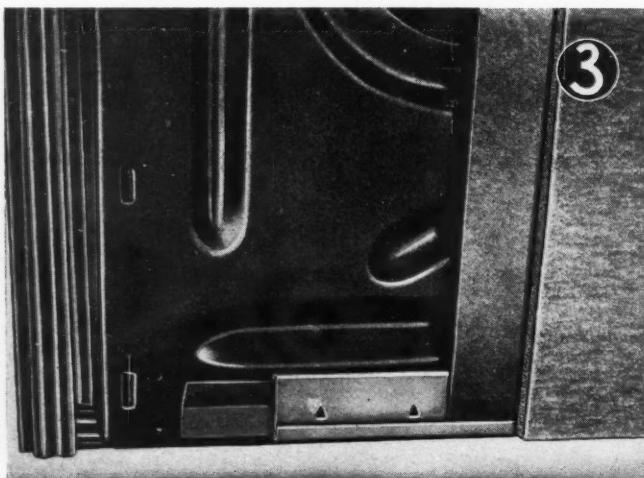
BUICK



1. Front Or Rear Door Garnish Molding Removal: Remove door inside locking rod knob by turning it off the rod. Remove the four screws from door header and faces. Pull loose at header and lift out.



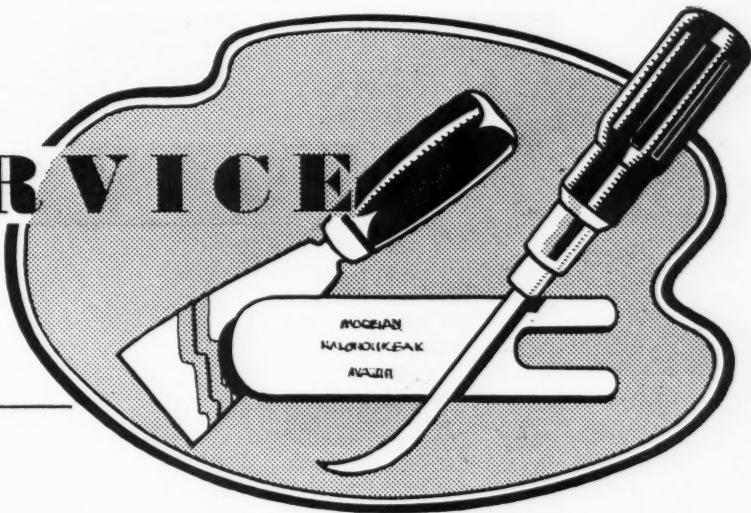
2. Door Inside Handle Removal: Press escutcheon plate against door trim pad (upholstery) to expose slot in handle. This can be done most easily by means of Buick tool No. B-201, as shown in Fig. 2. Then with a thin edged tool, push up and remove inside handle retainer spring which releases the handle.



3. Door Trim Pad Removal: Remove door garnish molding, door inside handles and door arm rest. Remove two screws at lower corners of trim pad. Pry loose the trim pad at the sides, then raise it to release it from the retaining strip. See Fig. 3. This strip is spot welded to the bottom of the door and to the retaining hooks at the center of the door.



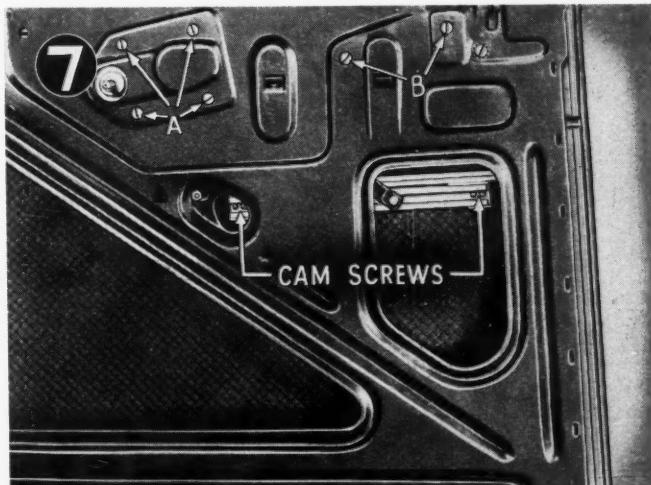
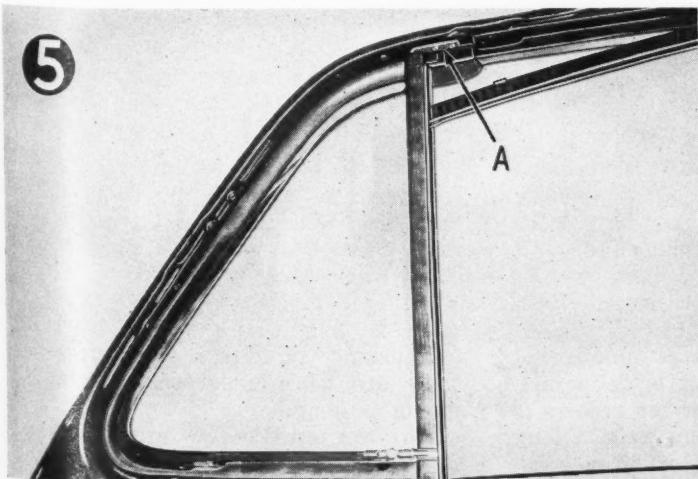
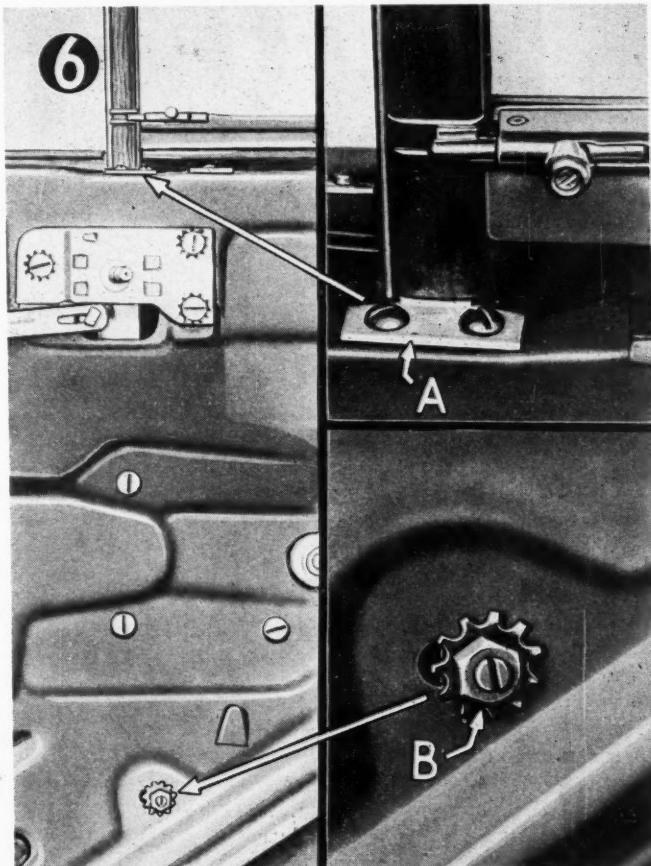
BODY SERVICE



header and one in the door lock pillar. Remove the Phillips-head screw holding the channel to the door lock pillar. This screw is two inches up from the bottom of the window opening. Loosen the door trim pad at lower rear corner to permit loosening the retaining screw at the bottom of the channel. Carefully release the channel at the top of the door and pull out.

5. Front Door Center Division Channel Removal: Remove door locking knob and garnish molding. Release the clips retaining the glass run channel at the center division channel section. Remove the two screws and nuts into which they thread in the door header, "A" Fig. 5. Remove the two Parker-Kalon screws holding the center division channel to the top edge of door inner panel. See "A" Fig. 6. Release door trim pad from bottom and remove the nut and adjusting stud at the bottom of division channel, noting before removal the length of the stud projecting out from the inner panel. This will insure proper adjustment when reassembling. With the door ventilator in an open position remove division channel.

6. Front Door Window Glass Removal: Remove door locking knob, window garnish molding, door inside handles, arm rest door trim pad, door center division channel. Loosen glass run channel at the top. Remove lower sash channel cam screws and disengage the cam from the cam support. Fig. 7. Remove glass by raising it almost to the closed position and then tilting inward.





MOST women do not take as good care of their cars as do the men. That's a well-known fact. Ever since there have been "two-car" families it has been a standing joke that when Mother's car isn't running as well as it should, it is high time to "lend" it to Dad for a day. He'll have it fixed and bring it home with a tank full of gasoline in the bargain.

But all of the women who drive don't have husbands to administer periodic doses of repairs. These women are being deprived of the kind of motor performance to which they are entitled; while you service men are also being done out of a lot of business from both these classes of women—business which is rightfully yours.

Of course, you may not want women in your shop. That's for you to decide. But it would seem to us that their money is as good as the next fellow's.

But before you or anyone else can cultivate this market you've got to know why the housewife doesn't take just as scrupulous care of her automobile as she does of her other possessions. You've got to see what is standing between her and better car care. Is her neglect deliberate?

FITTING YOUR SALES TALK

Make the gals realize the importance of maintenance

By ROSE LU GOLDMAN

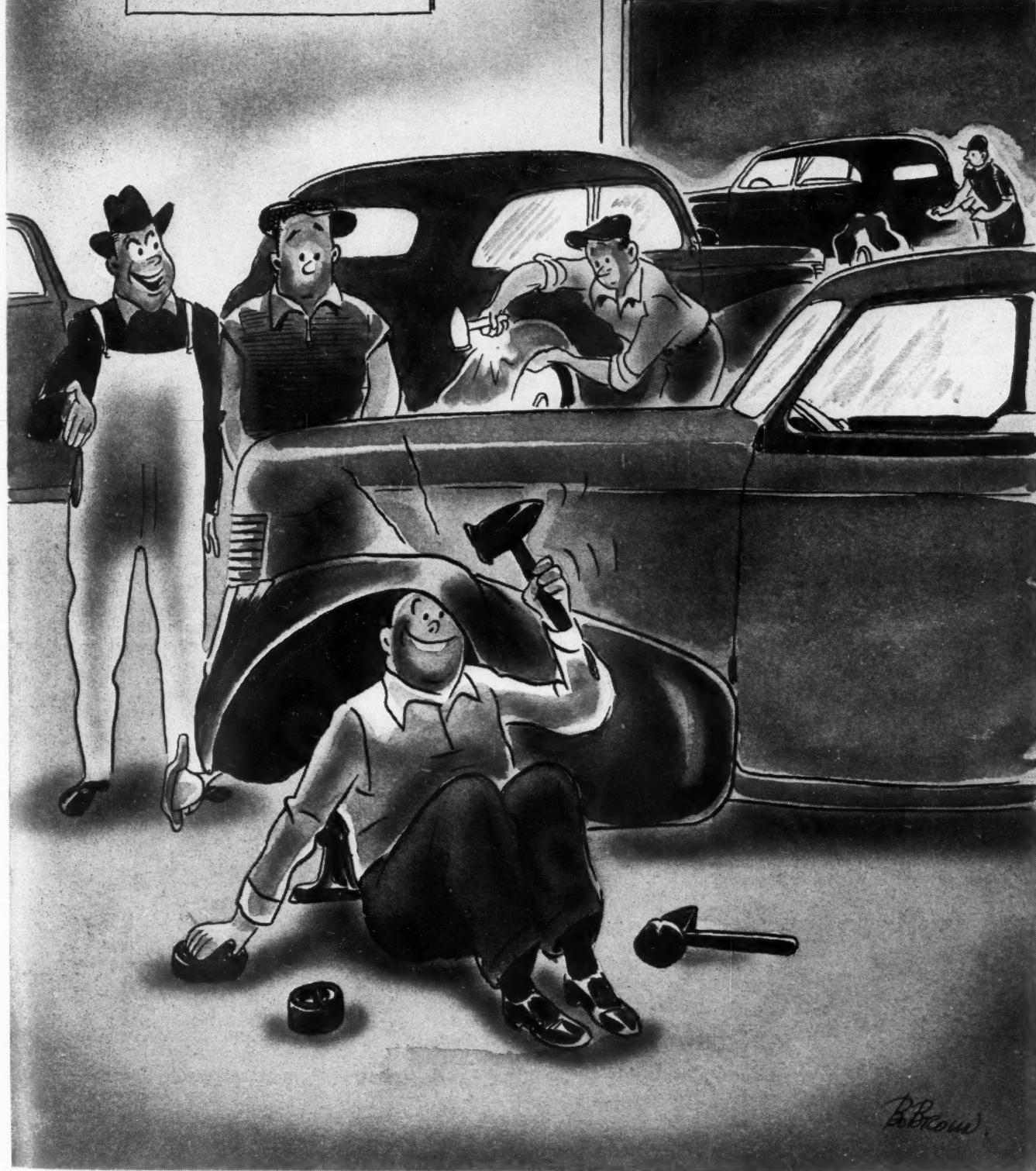
Is it due to ignorance? Is it because of fear of cost, or because of downright laziness?

There are a number of reasons that could be put forth, and probably any of them would be true for some women, and some of them would be true for most women. Probably there are a number of places where neglect is deliberate. If taking the car in for repairs is going to mean a long walk, a long wait, and a lot of expense—well,

you can't blame the lady for putting off the evil day as long as possible, can you? And, no doubt a great deal of neglect is due to ignorance of anything being wrong at all, or at least ignorance of the consequences of "letting it go." Perhaps she feels that new tap shoes for Susan (who is in dancing class now) are more important than a spring tune-up.

Her expenditures must be
(Continued on page 44)

BODY AND FENDER
STRAIGHTENING



"Ed's turned into a first class body man since he had that silver plate put in his skull!"

Service Hints

from

THE FACTORIES

Installing Transmission Shifter Lever

Care should be taken when re-installing the Pontiac transmission shifter lever to make sure that the proper lock washer is used under the attaching bolt to prevent the bolt from backing out and allowing the shifter lever to drop off the selector shaft. If the shifter lever drops off it prevents shifting gears, but it will not work loose if the bolt is properly tightened on a serviceable lock washer. The part number of the washer used on 1939 and 1940 models is 502482.

Rod Bearings Improved

A change has been made in the babbitt-lined connecting rods used in Studebaker six-cylinder engines from 1936 to 1940 models, inclusive, on all six-cylinder Studebaker Dictator, Commander and Champion cars.

The improvement consists of a chamfer added on both sides of the upper edge of the babbitt in the connecting rod bearing cap.

"Pop-Back" Through Carburetor (1939-40 Engines)

If "pop-back" through carburetor occurs on 1939-40 Chevrolet engines the following procedure must be followed to eliminate this condition:

Before changing spark plugs, check to make certain that the carburetor

has Metering Rod Hole Cover Stop Part No. 839099 installed. Early 1939 engines did not have this stop.

Check the operation of the Bakelite Metering Rod Hole Cover by slowly opening and closing the throttle several times to make certain that the cover is not sticking to the metering rod and riding upward, or that the cover does not stick to the upper portion of the stop in open position.

The cover may remain off its seat due to sticking to the meter rod or adhering to the top of the Metering Rod Hole Cover Stop due to capillary attraction of gasoline, gum or other deposits.

If this should be the condition, in normal car operation the mixture will be "lean" at higher speeds, limiting top speed and may cause "pop-back." At low speeds this will cause a "rich" condition, affecting economy and performance. This condition can be corrected in the following manner:

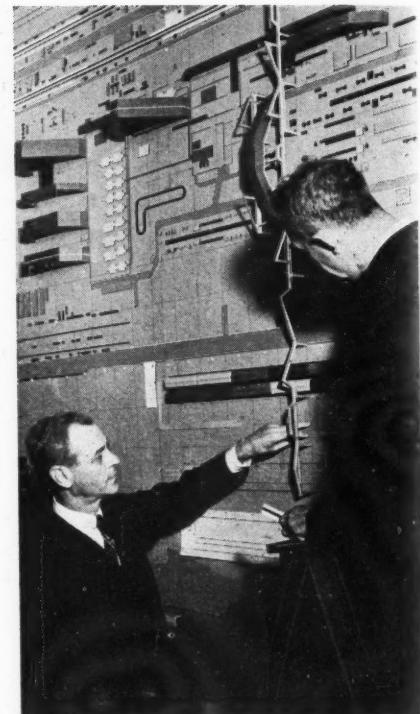
1. Remove Meter Rod Hole Cover Stop.
2. Open throttle wide.
3. Disconnect wire spring.
4. Turn Metering Rod and pull upward, removing it together with Metering Rod Hole Cover from carburetor.
5. Clean the Metering Rod and Bakelite Cover thoroughly.
6. Clean hole in Bakelite Cover with a No. 47 drill (.078 in.). Caution: A hole larger than No. 47 drill will "richen" the mixture.
7. Reassemble.
8. If the Metering Rod Hole Cover is functioning properly, check the spark plugs. Clean the insulators thoroughly. To be properly cleaned, the entire lower end of the insulators must be white. Set the gaps to .040 in., using a round feeler gauge, and reinstall.

Carburetor Loading

On complaints of slow warm-up or loading on Nash—1940, check hot air tubing for kinks at bend or pinching at point where tubing enters coil housing, which might restrict flow of hot air for proper operation of choke.



"What was that rush call all about, grandson?"



D. S. Eddins, Plymouth president (left), consults with plant engineer C. C. Williams at the three-dimensional master layout board of Plymouth's main factory in Detroit. The layout board, which is really a model of the factory floor, is indispensable in keeping cars coming off the assembly line without a hitch. On it is shown how all the various parts move into position to be at the right point at the right time to be ready for assembly into a complete automobile. When model changes are made, the board is studied carefully to determine the most efficient placing of supply points for new parts.

Sticking Throttle

To eliminate possibility of binding between throttle lever, or between pump arm and throttle connector rod on Hudson 6 and 8—1940 cars, a new rod 115-65 and connector rod washer 136-37, have been released by Carter to supersede 115-52.

Both new parts should be installed at one time.

Rear license plate

Attention is directed to the tightening of the rear license plate upper bracket on the Pontiac Special Six. When the upper bracket is loose allowing slight movements of the license plate, the air currents will cause the license plate to flutter when the car is driven at speeds upward of 50 m.p.h. This movement of the license plate will telegraph a rumbling, rattling noise into the car body through the stud in the rear compartment door which holds the license plate upper bracket. The remedy is to loosen the nut on the stud, drive the upper bracket down so that it holds the plate securely and retighten.



MOTOR AGE SHOP OF THE MONTH

Starting in business in 1927, Russell Hahn (circle), proprietor of Hahn's Service Garage, Dayton, O., now has a well-equipped shop with a gross income of \$45,000. Around 20 jobs a day come into the Hahn shop, keeping seven mechanics well occupied. In any slack times the boys go ahead on rebuilding of wreck jobs, the garage having developed quite a large business in this field as a sideline. Equipment investment, including service trucks, runs around \$6000. Best investment, said Hahn, is in the wheel aligner which is featured in the front window of the shop.

THE READERS' CLEARING HOUSE

Service Men's Queries

CLICK IN BRAKES

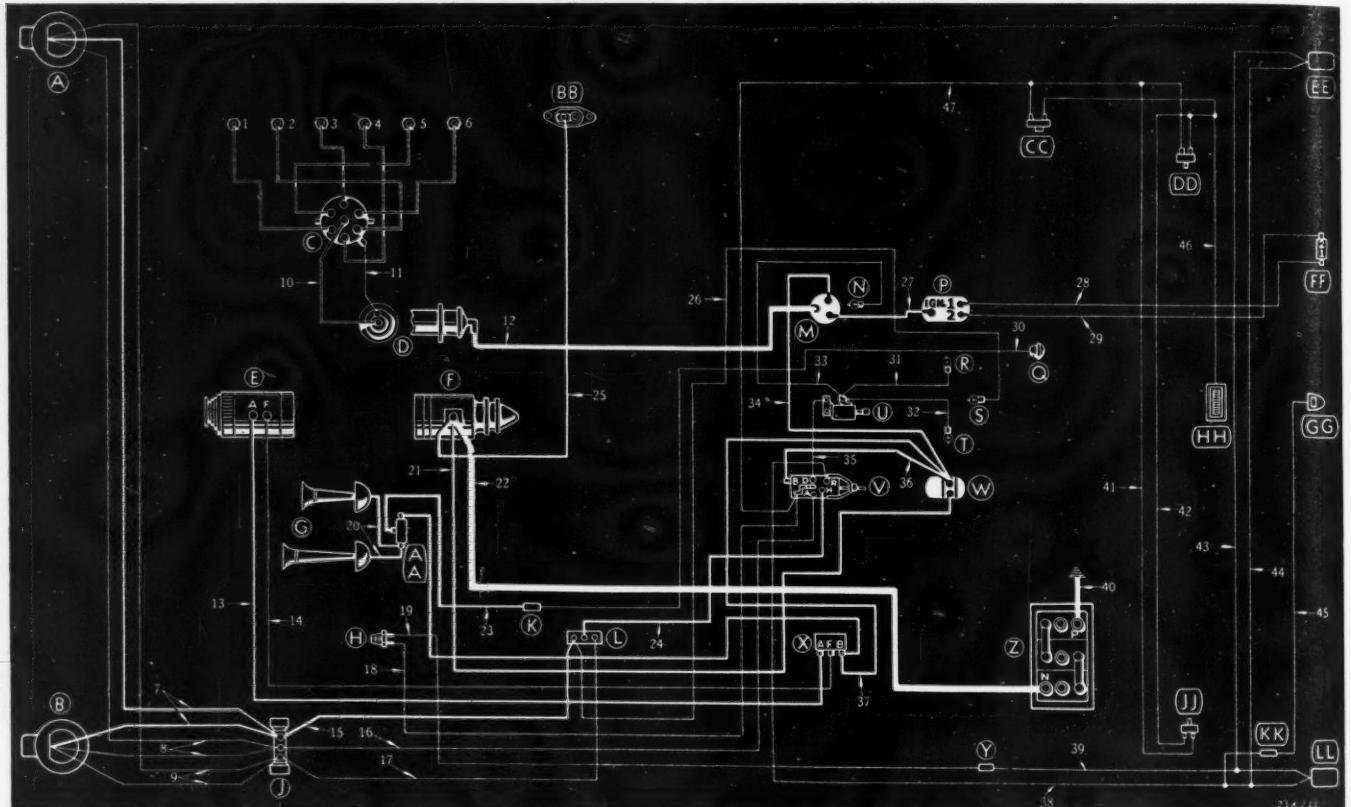
We have relined the brakes on a 1936 Lafayette car and the brakes click something awful when you go backward and also when going forward. They do not click all the same time. They click one right after the other in rapid succession. We have tried everything we know of and all anybody in this town knows of, so please let us hear from you soon so we can try what you have to suggest.

Egger's Garage & Auto Supply,
1032 East High Street, Jefferson City,
Missouri.

THE 1936 Lafayette used both Bendix and Lockheed brakes, but judging from your description, I am inclined to believe that this particular car is equipped with Bendix brakes. If that is true, then I believe the difficulty you are having is due to incorrectly located brake shoe anchors, or to the incorrectly installed brake shoe return springs.

My suggestion is that you readjust these brakes as follows: Jack up the wheel and turn the eccentric adjustment until you have exactly .010 inch clearance at the adjusting screw end of that particular shoe. Lock the ec-

centric in this position. The next step is to loosen the anchor bolt lock nut and shift the anchor until you have exactly .010 inch clearance between the drum and the lining of that same shoe. Lock the anchor in that position. The next step is to expand the shoe with the notched adjusting screw until both shoes are out against the drum and the wheel can just barely be turned over, using both hands. Next back off the notched adjusting screw until the wheel is free of any drag from the brake lining. Repeat this operation on the other three
(Continued on next page)



- A Headlight—right
- B Headlight—left
- C Ignition distributor
- D Ignition coil
- E Generator
- F Starter motor and switch
- G Horns
- H Signal lamp switch
- J Headlight cables terminal block
- K Cable connector
- L Headlight dimmer foot switch
- M Ignition switch and lock
- N Ignition switch light
- P Fuel gage (panel unit)
- Q Horn button
- R Instrument light—right
- S Headlight bright beam indicator light
- T Instrument light—left
- U Instrument light switch
- V Head and tail light switch and fuse
- W Ammeter
- X Voltage regulator
- Y Cable connector

1940 DeSoto S7-C Wiring Diagram

Z Battery

- AA Horn relay
- BB Automatic choke unit
- CC Windshield wiper motor
- DD Windshield wiper switch and circuit breaker
- EE Reading light pillar switch
- FF Reading light automatic door switch—right (7-pass. sedan and limousine)
- GG Tail and signal light—right
- HH Fuel gage (tank unit)
- JJ Reading light
- KK Rear license plate light
- LL Reading light automatic door switch—left (7-pass. sedan and limousine)

MM Cable connector
NN Tail and signal light—left

- 1-6 Spark plug cables (high tension cable)
- 7 Red
- 8 Yellow
- 9 Black
- 10 Secondary cable (high tension cable)
- 11 Primary cable (black)
- 12 Ignition switch cable
- 13 Red
- 14 Green
- 15 Red
- 16 Yellow
- 17 Black
- 18 Red
- 19 Red
- 20 Green
- 21 Red
- 22 Starter cable and terminal (—) negative
- 23 Green
- 24 Black

- 25 Black
- 26 Brown
- 27 Blue
- 28 Blue
- 29 Black and yellow
- 30 Red
- 31 Green
- 32 Red
- 33 Black
- 34 Brown
- 35 Black
- 36 Black
- 37 Black
- 38 Black
- 39 Brown
- 40 Yellow
- 41 Red
- 42 White
- 43 Red
- 44 Battery ground cable and terminal
- 45 Red
- 46 Yellow
- 47 Red
- 48 White
- 49 White
- 50 Yellow
- 51 Red
- 52 Brown

(Continued from preceding page)
wheels. This adjustment will provide the proper position of the brake shoes within the drum and will set the shoes pretty close to the drum itself so that there is very little travel of the shoe when the brakes are applied.

Next, try switching the brake shoe return springs. Maybe you have the primary springs on the secondary shoes.

LOW OIL PRESSURE

Have read your "Service Men's Queries" and have received some very good information but now I need some advice. Here is the trouble.

I have a 1937 Studebaker, Model 6A, which the customer ran low on

oil and burned out the front rod and loosened the rest of the rods and mains. He flattened the front throw of the crankshaft .022 in., which made it necessary to remove the motor and remove crankshaft and have this throw reground. The rest of the rod throws were worn only .001 of an inch so we did not have the rest of them reground. The main bearings were also within .001 of an inch. The car only has 26,000 miles on it. We installed new main bearings and new rods and a special bearing on the No. 1 throw. When the motor is cold it has about 50 lbs. pressure at about 40 miles per hour, and about 10 lbs. idling. When I drive it about two miles the oil pressure is good until it idles, then it drops to about 2 lbs.

I have increased the spring tension on the relief valve but this does not bring the pressure up at all on the idle part. The pressure is about 35 lbs. when the motor is hot and running at about 40 miles per hour, but when idling it drops to zero.

I talked to a man that has worked on these cars for about twenty years and he says that this model should have about 5 lbs. idling and about 40 lbs. at 25 to 30 miles per hour, with the motor hot, but when I drive at 30 miles per hour I have only 25 lbs. pressure.

Could my trouble be that the cam-shaft bearings are also bad and need replacing? If so, is there any way to fix it without taking the motor out again? Could there be a cam-shaft

plug purchased to cut down the oil flow to the camshaft bearings like the ones used on Chrysler cars? This car has plugs on the valve side of the motor.

Lee A. Christiansen, Low Moor, Iowa.

FROM your letter, I am inclined to believe that the work you have done on this car is all right. It is quite possible, of course, that the camshaft bearings are worn, particularly in view of the fact that so much damage was done to the crankshaft when this engine ran out of oil.

The camshaft bearings in this car are the split type steel back with babbitt linings. The camshaft is removed out through the front of the engine which means that you will have to remove the radiator, remove the timing gear cover, remove the cylinder head in order to take out the valves and valves lifters. Our Flat Rate Operations number M1 and M7 would cover the cost of this work.

You have been correctly informed in that this model should have about 40 lb. of oil pressure at normal driving speed. To the best of my knowledge, there is no metering plug available for this car similar to the type used on the Chrysler products.

Before you get into this job further, however, I suggest that you make an oil pressure test of the bearings. Then you will know just where the trouble is, and what work will be necessary to correct it.

HARD STARTING

I have a customer that has a 1937 Dictator Studebaker which runs all right, but when he stops the engine it will not start again until we take the air cleaner off and pour gas in the top of the carburetor.

Yost Garage, 1518 S. Main St., Salisbury, N. C.

THIS sounds very much to me as though there is a condition of vapor lock in this car. If this is true, I suggest you take the following steps in an effort to eliminate this trouble.

First of all, check the float level in the carburetor or more properly, the fuel level, with the top of the carburetor off and with the engine running. The fuel should be $\frac{1}{8}$ inches below the top of the float bowl while the engine is running. The next step would be to insulate the gasoline line from the fuel pump to the carburetor either by wrapping the line with asbestos or by building a metal shield between the line and the engine so that the heat radiated from the engine will not effect the gasoline in the fuel line. Another step is to install a thick gasket between the carburetor and the intake manifold. This gasket should be approximately $\frac{1}{2}$ to $\frac{3}{8}$ inches thick.

Another thing you should be sure of is that the engine is properly tuned.

Go over the spark plug gaps, breaker point gaps and valve tappet clearances to be sure they are properly adjusted, and of course be sure that the inside of the carburetor is clean.

BLOWS HEAD GASKETS

I have a Nash Lafayette 1220 model, 1938, that blows head gaskets about every 1500 to 3000 miles; it blows between 2 and 3 or between 4 and 5. I understand this motor was very hot when it blew the first one. I believe the head or block is warped. How is a good way to check these? It seems the gasket gets hot and turns black at these points, then just blows out. We have been tightening it with a tension wrench to 55 lbs., then after about 50 miles reset it with the same wrench to same tension.

Wonder if you could help me out on this one. We have put in 7 gaskets in about 14 months.

Wolfskill Garage, Slater, Missouri.

I BELIEVE you have hit on the right cause of this trouble because it certainly sounds as though either the head or the block of this engine is warped.

It should be easy enough for you to check this by removing the head and, after cleaning off the carbon, check the surface with a straight edge

to see just what distortion has taken place. You can check the block in the same manner. Naturally if you find either the head or the block to be warped, it will have to be planed off to a level surface or else replaced with a new one.

STOP THE OIL LEAK

I have been a subscriber to MOTOR AGE for a few years and like it. I have a 1936 Ford V-8 with a bad oil leak. I put two sets of gaskets in, but it leaks oil out the rear of crankcase through the cotter pin, so the

(Continued on next page)

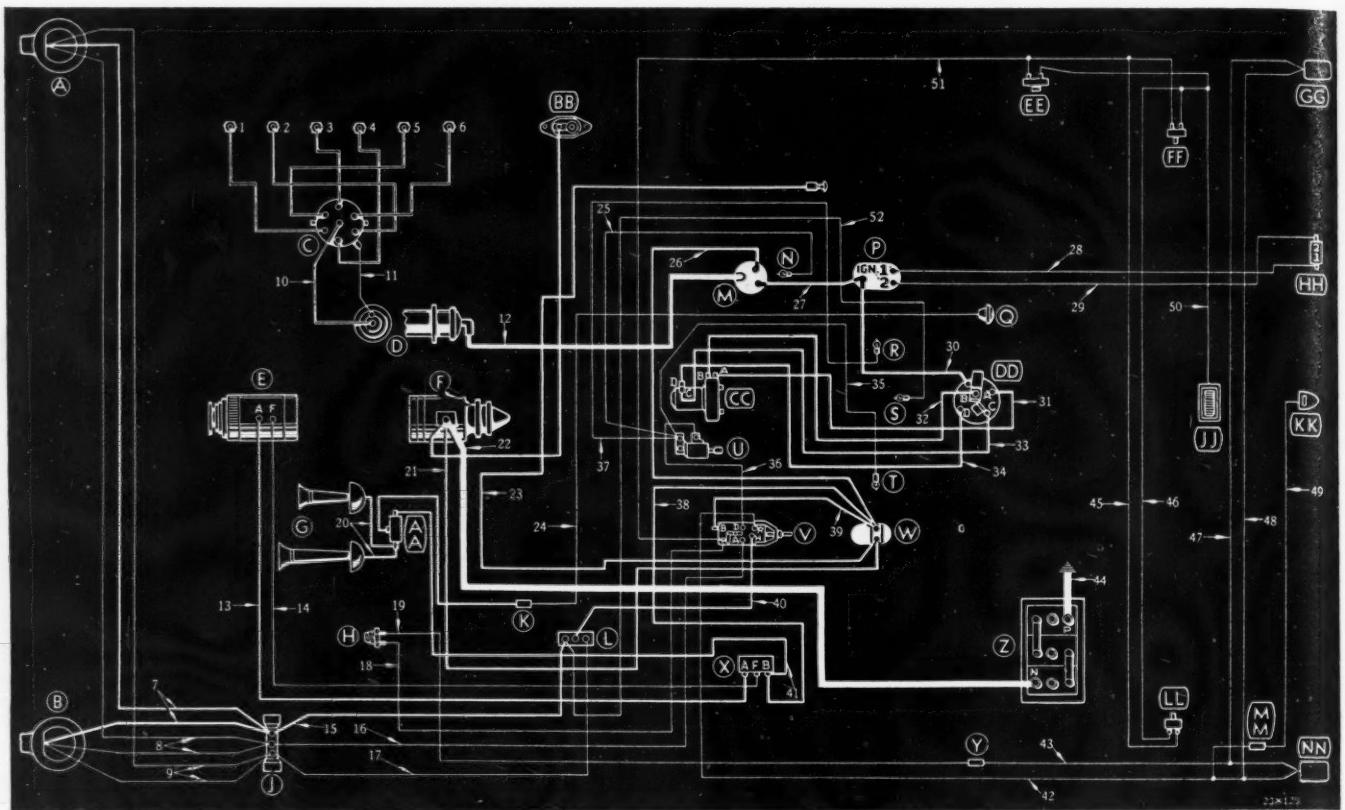
CURLEY'S DOLLAR!

Curley's Garage in Cincinnati, O., gets one dollar and the original drawing of the cartoon which appears on this page. You're invited to send in suggestions for this monthly "Remember This One?" Just send us the basic idea—we'll polish it up, if necessary—and if we use it you'll receive one dollar and the original drawing of the cartoon which is based on your suggestion.

We can't promise to enter into correspondence over your suggestions or to return those we are unable to use. If you see your idea and name published, you'll know the dollar and the original drawing will soon be on their way to you.

REMEMBER THIS ONE?





1940 DeSoto S7-S Wiring Diagram

A Headlight—right
B Headlight—left
C Ignition distributor
D Ignition coil
E Generator
F Starter motor and switch
G Horns
H Signal lamp switch
J Headlight cables terminal block
K Cable connector
L Headlight dimmer foot switch
M Ignition switch and lock
N Ignition switch light
P Fuel gage (panel unit)
Q Horn button
R Instrument light—right
S Headlight bright beam indicator light
T Instrument light—left
U Instrument light switch

V Head and tail light switch and fuse
W Ammeter
X Voltage regulator
Y Cable connector
Z Battery
AA Horn relay
BB Automatic choke unit
CC Reading light pillar switch
DD Reading light automatic door switch—right (7-pass sedan)
EE Tail and signal light—right
FF Fuel gage (tank unit)
GG Rear license plate light
HH Reading light
JJ Reading light automatic door switch—left (7-pass sedan)
KK Cable connector
LL Tail and signal light—left

1-6 Spark plug cables (high tension cable)	26 Brown
7 Red	27 Blue
8 Yellow	28 Blue
9 Black	29 Black and yellow
10 Secondary cable (high tension cable)	30 Black
11 Primary cable (black)	31 Black
12 Ignition switch cable	32 Black
13 Red	33 Black
14 Green	34 Brown
15 Red	35 Black
16 Yellow	36 Brown
17 Black	37 Black
18 Red	38 White
19 Red	39 Red
20 Green	40 Battery ground cable and terminal (+) positive
21 Red	41 Red
22 Starter cable and terminal (—) negative	42 Yellow
23 Green	43 Red
24 Yellow	44 White
25 White	45 White
	46 Yellow
	47 Red

(Continued from preceding page)
 trouble must be some other place than the gaskets. Most of my work is Ford work, but I never had anything like this on a V-8. In 25 miles it leaks about 2 quarts and when car comes back and the motor is stopped, there is a half pint on the floor in about 5 minutes.

This car was bought just about a month ago. The dealer told the owner it was a rebuilt motor. It does not look to me like a regular Ford rebuilt motor. Please let me know about this.

Ernest Mohr's Garage, 126 N. Fourth St., Emmaus, Pa.

JUDGING from your description, I am inclined to believe that this

leak is caused either by a poorly fitted rear main bearing or a leaking oil pump gear cover plate at the rear of the camshaft.

Some of the 1936 models used a bearing with the babbitt poured into the cap, while the later models used the slip-in type of bearing. If this particular car has the slip-in type of bearing, it will be an easy matter for you to replace the bearing shells with new ones, and this I believe, will stop the leak unless the crankshaft is scored or worn out-of-round. If, on the other hand, this car does not have the slip-in type of bearing, it will mean that the engine will have to come out and be sent to a shop where new crankshaft bearings can be fitted

and reamed to size.

If the leak is at the rear of the camshaft it will mean installing a new gasket between the block and the oil pump gear cover plate.

EXCESSIVE OIL CONSUMPTION

I need help with a 1932 Buick model 8-50. This car has been run about 5000 miles since I rebored it to .030 oversize. The rebore and overhaul job was unsuccessful as the car still uses a quart of oil every 200 miles.

Upon inspecting rings they seemed not to be worn in at 3000 miles after rebore job. I changed the fuel pump

also and installed a second set of rings with a light expander to take up excessive clearance, at the ring lands of the piston. The pistons being .030 oversize leaves the ring grooves too deep for an average ring.

I also cut down the amount of oil through the rocker arms, to prevent guides from sucking it into the firing chamber. I readjusted bearings and plugged the oil spit holes in the rods, checked thoroughly for oil leaks on the outside, and still the car uses about a quart of oil to 250 or 300 miles. The gasoline mileage is also poor—about 15 miles to a gallon.

The carburetor has lean jets and an exhaust analyzer registers lean at all speeds of the motor. I also installed a new clutch to prevent loss of mileage.

Ray Critz, 2905 Belmont Ave., Fresno, California.

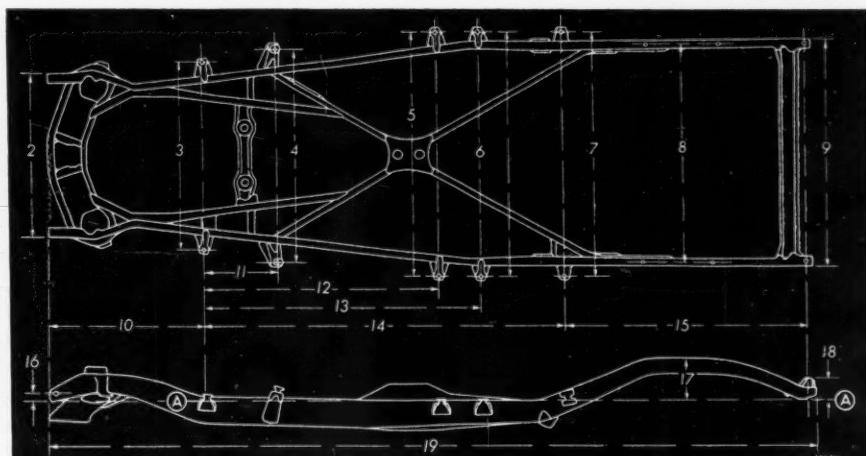
IN regard to the trouble you are experiencing in a 1932 Buick, inasmuch as you have reboored this job and installed oversize pistons and rings, it would seem to me that this would take care of the cylinder condition, provided, of course, that the pistons were correctly fitted and that the block was thoroughly cleaned after the reborning operation. As you know, if the block is not thoroughly cleaned and given a smooth finish, you will get excessive wear during the first thousand miles and the result is that you will have excessive piston clearance which in turn, results in increased oil consumption. In this connection, I would suggest that you check the piston clearance with a feeler gage just to make sure that it is not excessive.

I think it would also pay to install new valves and valve guides, particularly the intakes, so as to be absolutely sure that you are not drawing oil past the guides into the combustion chamber.

I think the bearings should also be checked and while you have adjusted them, it's entirely possible that you have excessive clearance on the sides of the bearings which will result in excessive oil throw-off. I would strongly advise making an oil pressure test on this job just to see how much oil is being lost at the bearings. Here again, if the loss is excessive, it would be necessary to replace the bearings and possibly recondition the crank-shaft. However, it is my guess that only the bearings would have to be replaced.

BIGGER JETS

We have a 1940 Plymouth with 3000 miles on it and up to the present time have been unable to eliminate a sort of a jerky action when decelerating or even floating under 25 or 30 m.p.h. The car drives along nicely as long as gas is being fed even at 10 miles an hour, but if foot is taken off pedal there is an intermittent jerk until gas



1940 DeSoto Frame Alignment

A—Top line of frame	10—36 $\frac{1}{2}$
2—35 (35 $\frac{1}{2}$ —7 pass.)	11—14 $\frac{1}{2}$
3—40 $\frac{1}{2}$ (40 $\frac{1}{2}$ —7 pass.)	12—50 $\frac{1}{2}$
4—45 $\frac{1}{2}$ (45 $\frac{1}{2}$ —7 pass.)	13—59 $\frac{1}{2}$
5—52 $\frac{1}{2}$	14—77 $\frac{1}{2}$ (94 $\frac{1}{2}$ —7 pass.)
6—52 $\frac{1}{2}$ (52 $\frac{1}{2}$ —7 pass.)	15—53 $\frac{1}{2}$
7—52 $\frac{1}{2}$ (52 $\frac{1}{2}$ —7 pass.)	16—1 $\frac{1}{2}$ (1 $\frac{1}{2}$ —7 pass.)
8—46 $\frac{1}{2}$	17—9 $\frac{1}{2}$
9—48 $\frac{1}{2}$ (48 $\frac{1}{2}$ —7 pass.)	18—5 $\frac{1}{2}$
	19—169 $\frac{1}{2}$ (183 $\frac{1}{2}$ —7 pass.)

is fed again. This is specially true when engine is very hot but is never noticed when car is first taken out in the morning.

This may have no connection but there is also a sharp crack which appears to come from the back when the car is started quickly from a dead stop in low gear. R. & W. Graham, Box 205, Oakville, Ontario, Canada.

THIS condition is very possibly caused by too lean a jet in the carburetor. Some of the boys have reported a similar condition and have been able to correct it by installing the next size richer jet in the carburetor. I am sure your local carburetor supply house will be able to supply this jet, and from what the boys tell me, I feel confident that will correct this condition.

The clicking noise to which you have reference when the car is suddenly started from a stand is probably due to loose rear axle shaft nuts and can be corrected by tightening.

WATER LOSS

I have a 1935 Ford V-8 that pumps water out through the overflow. Have put on larger radiator and it still acts the same. This car has been in several garages and no results. What would you advise?

John A. Berg, Eldred, Minnesota.

THREE are two conditions which might be responsible for this trouble and which should be checked. The first is the condition of the water pump shafts. If these shafts are worn so that the pumps are taking in air, it will undoubtedly cause an unusual rise in the water level in the radiator and, of course, cause considerable loss

out the overflow pipe. The other condition is that of cylinder head gaskets. If these gaskets have been on for some time, it is quite possible that there is a compression leak in the gasket between the combustion chamber and the water channel. Under this condition, compression pressure would be allowed to leak out into the water channel and would cause a pressure rise in the water level in the radiator, forcing the water out through the overflow pipe.

My first suggestion, therefore, is that you overhaul the water pumps and the second suggestion that you install new cylinder head gaskets.

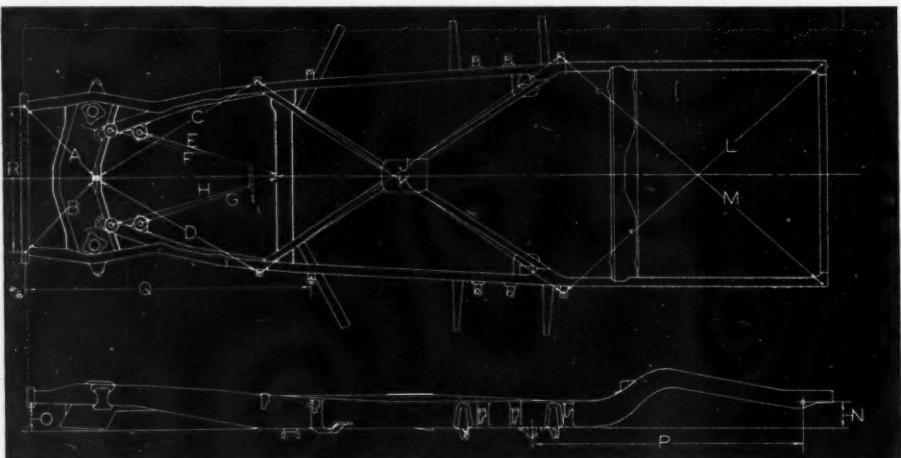
If neither of these operations correct the trouble, then I suggest that you remove the water pump and cut slots in the vanes of the impellers so as to cut down the efficiency of the pumps. This practice amounts to a correction of the effect and not the cause, but under some conditions it is justified. I believe, however, that you will find the trouble to be an air intake into the cooling system either through the water pumps or through the cylinder head gaskets.

WHAT CAUSES RUST?

I would like to know the cause and remedy for rust appearing between the ball on the tappet adjusting screw and the push rod on overhead valve motors.

There appears to be plenty of oil getting to this ball and tappet adjustment. I tried cleaning the oil lines and have had temporary success. Would appreciate it very much if you would give me the reason for this condition and also the remedy to cure it.

I have been taking MOTOR AGE for
(Continued on next page)



1940 Hudson Frame Dimensions

Models	W.B.	A	B	C	D	E	F	G	H	
40	113"	21 $\frac{1}{8}$	21 $\frac{1}{8}$	35 $\frac{1}{8}$	35 $\frac{1}{8}$	30 $\frac{1}{8}$	....	30 $\frac{1}{8}$	....
41	118"	21 $\frac{1}{8}$	21 $\frac{1}{8}$	39 $\frac{1}{8}$	29 $\frac{1}{8}$	30 $\frac{1}{8}$	....	30 $\frac{1}{8}$	....
43	125"	21 $\frac{1}{8}$	21 $\frac{1}{8}$	39 $\frac{1}{8}$	39 $\frac{1}{8}$	30 $\frac{1}{8}$	....	30 $\frac{1}{8}$	....
44, 45	118"	21 $\frac{1}{8}$	21 $\frac{1}{8}$	39 $\frac{1}{8}$	29 $\frac{1}{8}$	....	37 $\frac{1}{8}$	....	37 $\frac{1}{8}$	
47, 48	125"	21 $\frac{1}{8}$	21 $\frac{1}{8}$	39 $\frac{1}{8}$	39 $\frac{1}{8}$	....	37 $\frac{1}{8}$	....	37 $\frac{1}{8}$	
Models	W.B.	J	K	L	M	N	O	P	Q	R
40	113"	78 $\frac{3}{4}$	78 $\frac{3}{4}$	72%	72%	4 $\frac{1}{8}$	5 $\frac{1}{8}$	57 $\frac{1}{8}$	54 $\frac{1}{8}$	30 $\frac{1}{2}$
41	118"	78 $\frac{3}{4}$	78 $\frac{3}{4}$	72%	72%	4 $\frac{1}{8}$	5 $\frac{1}{8}$	57 $\frac{1}{8}$	59 $\frac{1}{8}$	30 $\frac{1}{2}$
43	125"	84 $\frac{1}{2}$	84 $\frac{1}{2}$	72%	72%	4 $\frac{1}{8}$	5 $\frac{1}{8}$	57 $\frac{1}{8}$	59 $\frac{1}{8}$	30 $\frac{1}{2}$
44, 45	118"	78 $\frac{3}{4}$	78 $\frac{3}{4}$	72%	72%	4 $\frac{1}{8}$	5 $\frac{1}{8}$	57 $\frac{1}{8}$	59 $\frac{1}{8}$	30 $\frac{1}{2}$
47, 48	125"	84 $\frac{1}{2}$	84 $\frac{1}{2}$	72%	72%	4 $\frac{1}{8}$	5 $\frac{1}{8}$	57 $\frac{1}{8}$	59 $\frac{1}{8}$	30 $\frac{1}{2}$

(Continued from preceding page) quite some time and enjoy it very much. Also use the Chilton Book for all my labor costs and prices. Would appreciate your putting this in MOTOR AGE for I am sure there are other mechanics who would benefit from same.

E. G. Schmidt, 3704 Easton Avenue, St. Louis, Missouri.

THE only reason I can think of for this condition is lack of a sufficient supply of oil to prevent the formation of rust, which is due to condensation. This condition is rather common as you say, and I think in the majority of cases it is due to a temporary stoppage of oil in the drilled passage of the rocker arm or at the bushing. Cleaning out this oil passage usually corrects the trouble.

Some of the boys squeeze the oil return pipe a little with a pair of pliers to put a restriction in it so that more oil will be forced out at the rocker arms. This will insure a more liberal oil supply at the tappet adjusting screw, and help to prevent rust formation at this point.

CARBURETOR ADJUSTMENT

Please send me instructions covering Schebler Carburetor UC53 Model U, used on 1930 Reo Flying Cloud. Runs very rich and I don't know the settings or float level. H. R. Maxfield, New Hartford, Conn.

THE idle adjustment of this carburetor should be set with the pointer in the center of the range marked "R" "L" on the side of the carburetor. The power adjustment which is the adjusting screw located near the bottom of the bowl, should be set so that

the end of the screw is flush with the end of the pin alongside the screw. The economy adjustment is set as follows—speed the engine up about 30 m.p.h., loosen the set screw in the collar of the economy adjusting screw and turn the economy adjusting screw out or counterclockwise until the motor begins to surge, then turn the adjusting screw in or clockwise until the motor smooths out. This is the proper setting for the economy adjuster. Be careful to turn this adjusting screw in only enough to get away from the surging condition because if you go too far the mixture will be rich in the normal driving range above 30 m.p.h.

This carburetor is not particularly sensitive to the float height adjustment but just as a guide the float should be set with the carburetor turned upside down and the distance from the float chamber flange to the top of the float set at 1 5/16 in.

GEAR GROOVE

I have taken MOTOR AGE for about five years, and have found a lot of good information in it. But I am stuck on a 1940 Ford 1 1/2-ton truck transmission. This truck has a growl in it at idling speed, when in neutral, and clutch is out. When pressing clutch in the noise stops completely. And when prying up on drive shaft it quiets down considerably, but does not stop completely.

I have installed two new bearings in it, one on main drive gear and the other on rear of transmission. This seemed to stop it completely for about two miles of driving, and when I stopped it was doing the same thing again. It has had this noise since it was new. Can it be possible that the

transmission case is not in line with the two holes that the bearing fit in the rear and front? Mathews Garage, Millstadt, Ill.

I THINK your diagnosis of the trouble you are experiencing with a Ford 1 1/2-ton truck transmission is correct; in other words, I think there is some misalignment between the transmission and the flywheel, or possibly the clutch shaft is sprung.

I would suggest you check the clutch shaft on a lathe to make sure it is running true. In addition to checking the alignment of the transmission, I would mount a dial gage on the flywheel and have the button of the gage contact the machined surface of the flywheel housing. Crank the engine slowly, and note the reading of the dial gage which should not exceed 0.003 in. Then mount the dial gage on the flywheel housing and have the button contact the flywheel. Here again the variation should not exceed 0.003 in. In the same manner fasten the dial gage to the clutch shaft with the button contacting the machined surface of the clutch housing and check back for trueness.

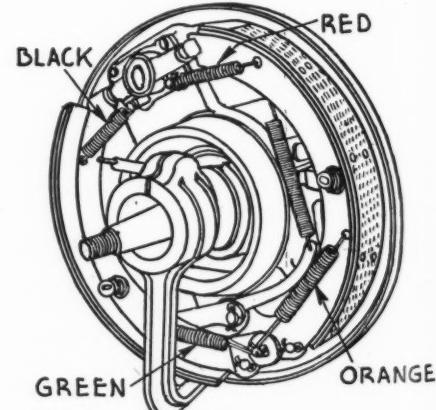
On reassembling the transmission to the engine, be sure the bolts are pulled up evenly. In other words, pull them up a little at a time and work diametrically across the housing until all of the bolts are tight.

There is also a possibility that the trouble might be in the counter shaft and in this connection, I would suggest that you carefully examine the counter drive gear and counter shaft driving gear. Very often imperfections in the gear tooth surface are not visible to the naked eye, and it is generally advisable to use a magnifying glass.

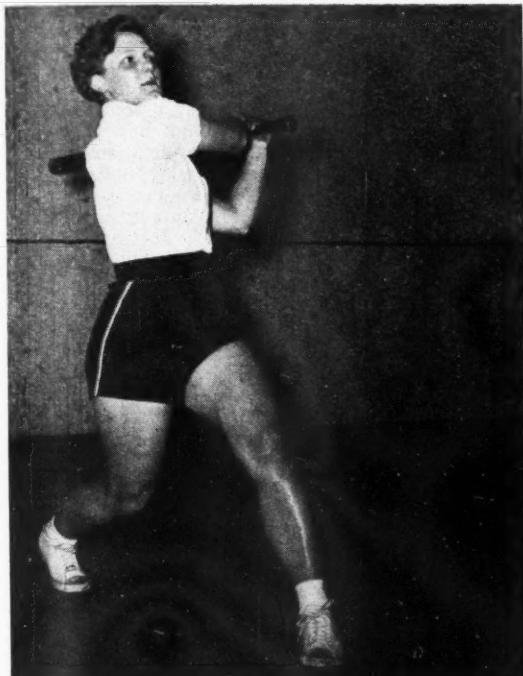
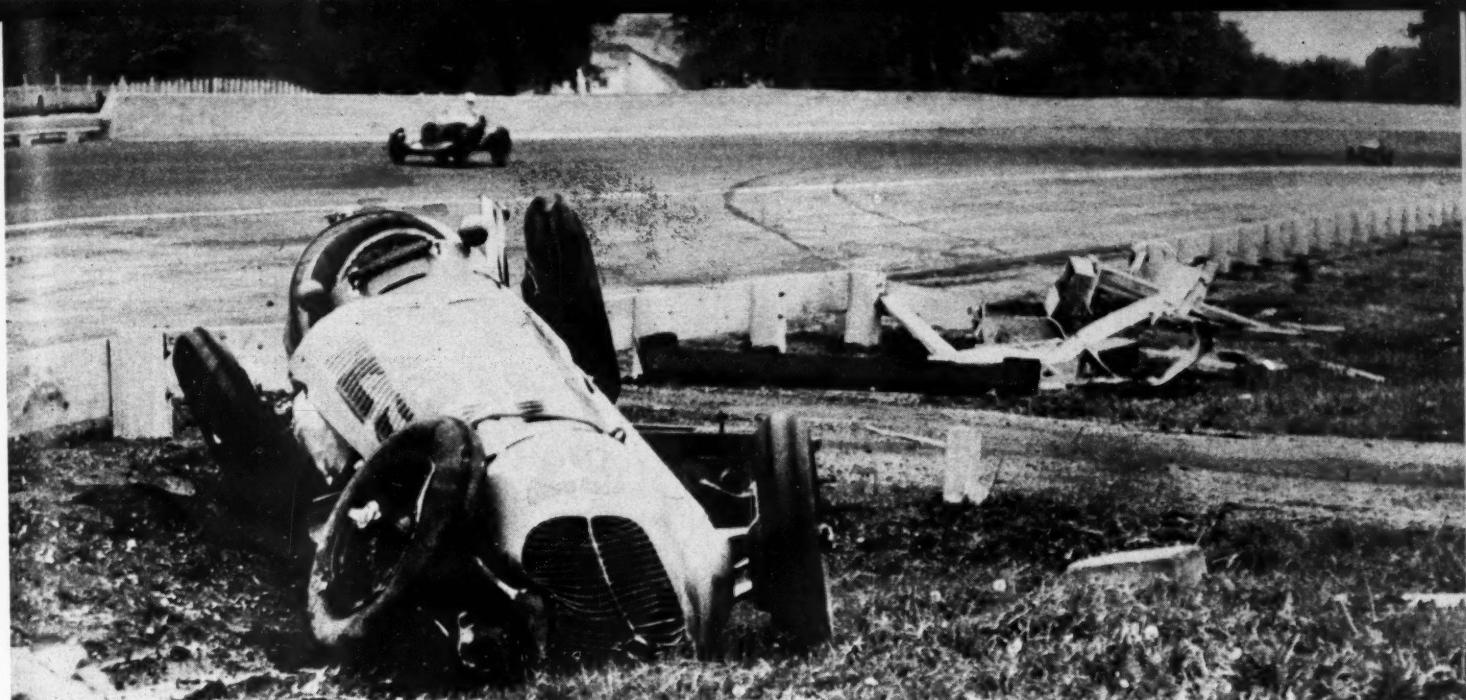
WHERE DO THE SPRINGS GO?

Will you please give me the color and locations of springs in a 1937 Ford brake?

Page's Garage, Cor. Main and Wilson Sts., Brewer, Maine.



IN accordance with your request, we are reproducing an illustration of the 1937 Ford brake on which we have marked the color location of the various brake springs.

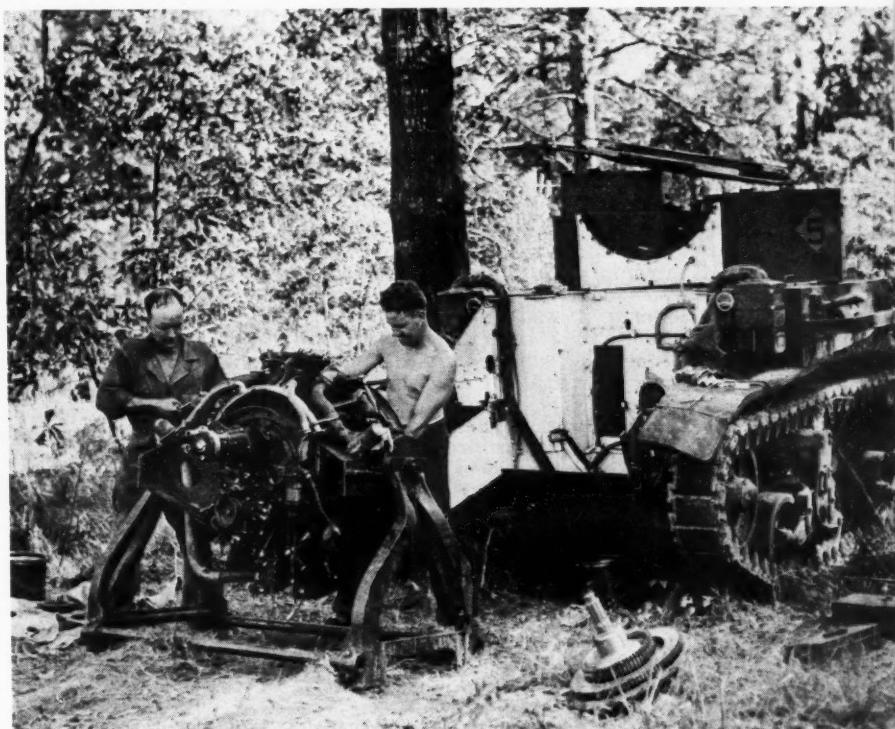


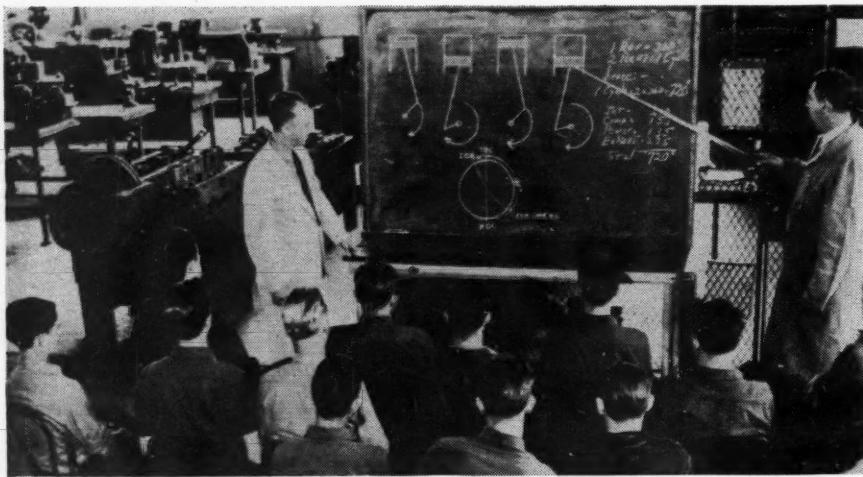
(Above) The distinction of being Philadelphia's only female auto mechanic goes to Lorraine Sargent. She operates a garage and auto repair shop because she likes the work and wants to prove that a girl is capable of doing a man's job. Lorraine's chief pastime is playing softball.

(Top right) Members of the U. S. Army Tank Corps. pause in the midst of war games to make repairs on the engine of their tank. Mass maneuvers of these mobile fortresses are now getting wartime test on the battlefields of Europe. With an increasing number of tanks being produced in this country, there may soon be an urgent need for skilled mechanics to handle their maintenance.

(Lower right) New front bumper treatment developed experimentally by George Walker, industrial stylist, who believes that conventional design detracts from rather than enhances the styled beauty of modern cars. His objective is to perfect "design-unity" with the front grille work—incorporating shock-absorbing mechanism for the bumper rather than rigid mountings from the car's frame.

(Above) We're late with this one, but we thought you would be interested anyway in how Raul Riganti's Maserati special looked after it crashed into a wall and overturned twice, during the 500-mile auto race classic on the Indianapolis Speedway, May 30. Although the crack-up looks bad, Riganti suffered only a slightly wrenched back and a small cut on his cheek.





"To meet the demands rising out of the national emergency" more and more C.C.C. boys are being trained as skilled and semi-skilled automobile mechanics. At the present time about 11,000 enrollees are receiving intensive training in the central repair shops of the corps. This number is being steadily augmented in connection with the National Defense Program. The boys are trained as truck and tractor drivers, welders, machine operators, and repair men. In the photograph above enrollees are shown receiving instruction in mechanical theory from O. W. Shelor. J. J. McEntee (left), director of the corps, looks on.

Goodrich Announces "Liberty Rubber"

Offers Public First Tire Made of Domestic Materials

Using a new synthetic, Ameripol, described as the long-sought "Liberty Rubber" capable of replacing the natural product, The B. F. Goodrich Co. has begun the manufacture for the public of America's first passenger car tire of domestic materials, John L. Collyer, president, announced. The material is an exclusive Goodrich product which does not infringe any existing patents, it was stated. This "Liberty Rubber" has been named by Goodrich, Ameripol, which signifies a polymer or recombination of molecules of American materials. Goodrich has had in operation for more than a year and a half a pilot plant producing Ameripol, and it is now being made in a semi-commercial plant. A manufacturing plant which will have a daily capacity of several tons of Ameripol is under construction, to be ready this fall. Additional units of the same type, it was emphasized, can be constructed to produce any required amount.

The new Goodrich tires use Ameripol to replace natural rubber in proportions varying from 50 to 100 per cent. Mr. Collyer emphasized that if the industry were to replace with Ameripol the natural rubber in the tire treads and side walls alone, it would reduce by approximately one half America's consumption of the natural product.

"It is my personal opinion and fervent prayer that our rubber supplies will not be interrupted," Mr. Collyer said, "but rubber is too vital a product for us to follow any course but a safe one."

Collyer stated that, according to the best authenticated figures, consumption of synthetic rubber last year in the United States amounted to 1,700 tons against a consumption of natural rubber totalling 592,000 tons. "These

figures indicate," he said, "the situation that the United States must deal with before we can breathe easily should an emergency arise to threaten our rubber supplies. The big question has been—bearing in mind that tires account for over 70% of our country's usage of rubber—"when will we have a satisfactory tire built of our country's own materials?

Buna N, buna S, ameripol, butyl, neoprene, thiokol, koroseal, chlorex, vinyon—these comprise only a limited roster of the successes of American scientists in devising methods of utilizing home-produced raw materials to make synthetic rubber and rubber-like materials.

Utilizing petroleum, natural gas, coal, limestone, and air, America in 1940 appears to be approaching both independence from foreign sources for rubber, one of its most necessary raw materials, and the assurance that whenever a declining supply, or economics require, the change-over rapidly can be made.

For the mass production products, tires and inner tubes, the synthetic rubbers which use petroleum as a raw-material base seem to offer the lowest-cost, large-quantity production possibilities. These petroleum-base rubbers, the two bunas, ameripol, and butyl, all have been reported as commercially practicable in this country since the beginning of 1940.

The other synthetic rubbers, most of which have been marketed for a number of years, usually start with natural gas or coal. So far they have been substantially higher in price than natural rubber, but the greatest advances in quality which they permit in the manufacture of many rubber specialties with specific qualities already has built up a large market.

GM Moves in Defense Program

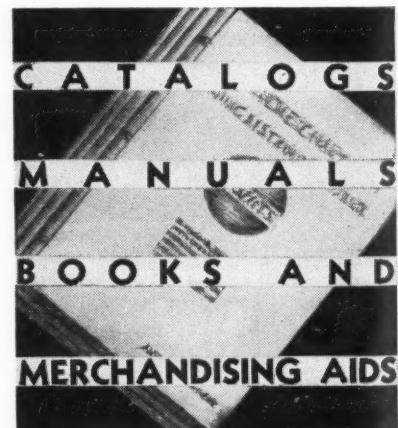
Alfred P. Sloan, Jr., chairman, announced certain changes in the General Motors organization to facilitate an aggressive execution of such part of the National Defense Program as may be assigned to General Motors.

Mr. Sloan stated that the production of highly technical equipment which would naturally be involved in such a program will require in many cases a considerable background of engineering, not only for the development of new machinery, but for the modification of existing machinery for its adaptation to military purposes.

For the purpose of better coordination and more effective administration of the corporation's part in the National Defense Program, J. D. Mooney, vice-president in charge of the overseas group, New York, has been relieved of his responsibilities in this connection, and is transferred to Detroit as executive assistant to C. E. Wilson, acting president, in full charge of all negotiations involving defense equipment, and of such liaison activities as may be necessary in connection with the engineering and production of same. Graeme K. Howard, vice-president and general manager of overseas operations, New York, will assume general supervision of the overseas group, in place of Mr. Mooney.

Albert Bradley, vice-president in charge of finances, New York, is transferred to Detroit, and will assume additional duties as executive assistant to the acting president.

These changes and assignments are of an emergency character and have necessarily no bearing on the corporation's normal staff responsibilities.



To receive a copy of the free literature mentioned in some of the following items, just check the square on the postcard on page 50 which corresponds to the letter given the literature you desire.

The Wilkening Mfg. Co., Philadelphia, Pa., has developed a jobbers' catalog unit for counter catalogs. Made of metal with a dark crackle brown finish, the unit has incorporated a fluorescent tube light which distributes a soft shadowless light over 30 in. of catalog sheets. Chrome trim adds to the modern attractiveness of the unit. Its full capacity is

24 1-in. sections, but there is provision for adding 6-in. extensions to the base on each side if needed. It is available to jobbers at \$26.75, which is said to be about half its regular value.

The 1940 edition of the Goodrich Red Book is now available for the tire, battery and automotive accessories trades for use as a product catalog and merchandising guide, it is announced by The B. F. Goodrich Co., Akron, Ohio. Check "A" on the post card for your copy.

The United States Electrical Tool Co., Cincinnati, Ohio, has just issued its latest catalog, No. 56. It covers the complete line of electrical tools manufactured by this company, illustrating and describing in detail the tools developed over a period of over 40 years. A check in the "B" square on the post card will bring you your copy.

"Do You Know the \$100,000,000 Moto-Scoot Market?" is the title of a booklet explaining the profit possibilities in the Moto-Scoot field, published by the Moto-Scoot Mfg. Co., 8440 S. Chicago Ave., Chicago, Ill. Get your copy—check "C" on the post card.

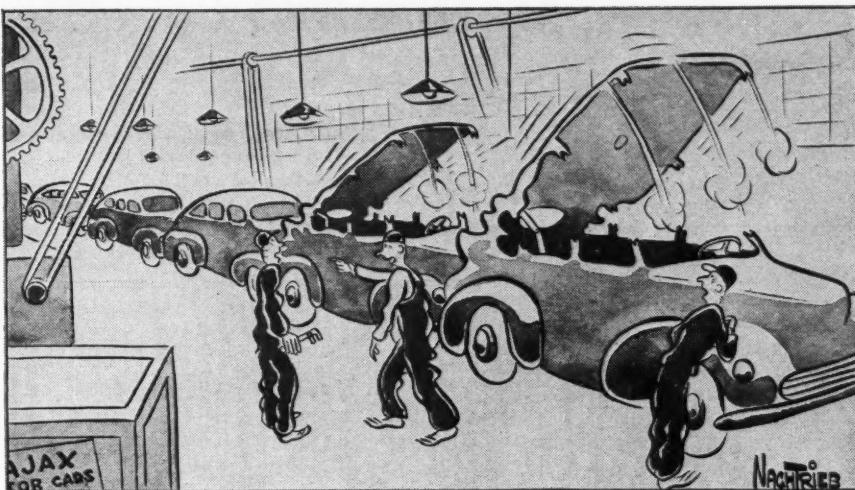
Stow Catalog No. 40 is off the press, published by the Stow Mfg. Co., Binghamton, N. Y. It lists and describes the complete line of flexible shaft machines manufactured by the company, classified under the headings of Truck Models, Adjustomat Models and Radial Arm Models. A cross reference enables the user to determine the correct machine for a particular application. Check "D" on the post card for your copy.

The Harnischfeger Corp., 4400 W. National Ave., Milwaukee, Wis., manufacturers of welders, electrodes, cranes, hoists and power excavators, has released the first issue of *The P & H Weld*, a publication to be issued regularly to those interested in welding, particularly the welding operator. The purpose of the new magazine is to act as a central bureau for receiving and disseminating information on current welding practices. Get your name on the mailing list by placing a check mark in the "E" square on the post card.

Grey Rock has issued its 1940 edition of "Engineers Technical Data for Balancing Brakes," containing 40 pages of charts, diagrams, troubleshooting tips and instructions covering virtually every popular type of brake in use today. The U. S. Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa., will send you a copy if you place a check mark in the "F" square on the post card.

Two new booklets by the Crescent Co., Pawtucket, R. I., are available upon request. Check "G" on the post card. One booklet explains the features of "Wiry Joe" battery cables and the other contains hints on increasing profits from cable replacement sales.

The Ahlberg Bearing Co., 4713 S. Whipple St., Chicago, Ill., has just (Continued on page 46)



"Find out who's installing those automatic convertible top operating mechanisms on every model that comes along!"

Walker Announces "Individual Tuning"

Individual Tuning of Walker Exhaust Silencers and Pipes to the specific requirements of individual cars and motors . . . that's the engineering program just completed by Walker Manufacturing Co.

Well-known to engineers is the vital part proper exhaust control plays in motor performance. Greater and greater have grown the demands of the modern automotive engine on the efficiency of the exhaust system. Today's cars, outwardly alike, are as "individual" as people. Each make and model car, each motor demands individualized exhaust control for top efficiency. Slight variations in back-pressure may seriously affect performance. Almost imperceptible noises, unless controlled, may build up vibrations and driving fatigue.

To meet these new conditions, Walker Silencers and Pipes are "Individually Tuned" to the specialized requirements of the particular car and motor on which they are to be used.

To the basic patented Walker "Louvered Tube" construction have been added design features such as inner tubes, high and low frequency chambers, tuning necks, "spit" chambers, and cross-overs as individual engines required. Headers and shell

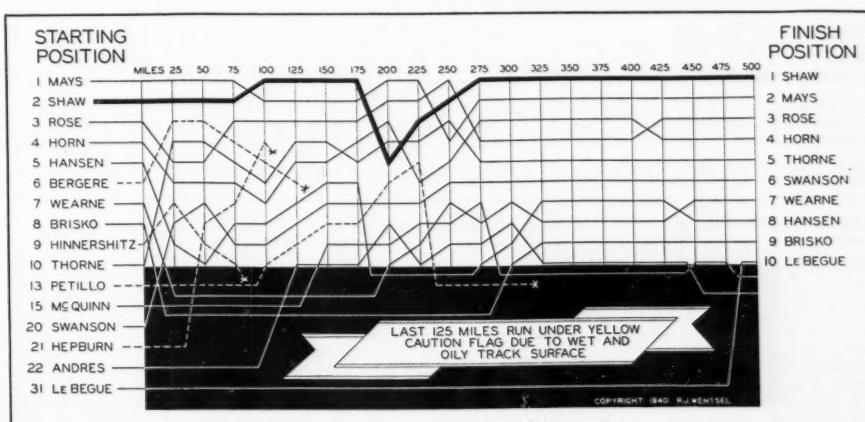
constructions have been modified to meet individual conditions. New materials and gauges of materials have been adopted to meet individual demands.

Remodel Pier for A.S.I. Show

More than a hundred thousand dollars is being spent in renovating and remodeling the Navy Pier in advance of the Automotive Service Industries Show scheduled to be held in Chicago, Dec. 9 to 14. The largest expenditure will be used for bridging the two piers which will make possible housing of exhibits on the front end of both piers. This change will make the exhibit area practically twice as wide and half as long and will effect greater equalization of location values for display purposes.

Representatives of the City of Chicago have been in conference with members of the Joint Operating Committee which is in charge of the Automotive Service Industries Show for the three associations which sponsor it: the Motor and Equipment Wholesalers Association, Motor and Equipment Manufacturers Association, and the National Standard Parts Association. Such conferences have been for the purpose of carrying out the vast remodeling project with the needs of the A.S.I. Show especially in mind.

A Chart Picture of the Indianapolis Race



Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the

Line Number	MAKE AND MODEL	Lowest Priced 4-D. Sed. (Divd.)	Wheelbase (In.)	Tire Size (In.)	No. of Cylinders, Bore and Stroke	Taxable H.P.	Piston Displacement (Cu. In.)	ENGINE										CHASSIS									
								Maximum Brake HP. at Specified R.P.M.	Compression Ratio (to 1-1)	Displacement Factor $\frac{S}{C}$	Cylinder Head Material	Camshaft Drive Make	Fiston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	Type and Make	Gearset Make	Universal Type and Make	Rear Axle Type and Make	Rear Axle Ratio	Front Spring Suspension	Service Brake	
1	Bantam	65	75	4.00/15	4-2.26x3.12	8.17	50.1	22-3800	7.40	...	CI	Own	Ais	No	AC	Zen	McK	AL	AL	P.Ro	WG	m-UP	1/2 Spi	5.25	Tr		
2	Buick	40-40	996	121	6.50/16	8-3 1/2 x 4 1/8	30.6	248.0	107-3400	6.10	37.0	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OL	Own	Mp-G-S	1/2 Own	4.40	IC	
3	Buick	40-50	1109	121	6.50/16	8-3 1/2 x 4 1/8	30.6	248.0	107-3400	6.10	35.8	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OL	Own	Mp-G-S	1/2 Own	3.90	IC	
4	Buick	40-60	1211	126	7.00/15	8-3 1/2 x 4 1/8	37.8	320.2	141-3600	6.25	38.9	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OL	Own	Mn-G-S	1/2 Own	3.90	IC	
5	Buick	40-70	1359	126	7.00/15	8-3 1/2 x 4 1/8	37.8	320.2	141-3600	6.25	38.8	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OL	Own	Mp-G-S	1/2 Own	4.18	IC	
6	Buick	40-80	1553	133	7.50/16	8-3 1/2 x 4 1/8	37.8	320.2	141-3600	6.25	38.3	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OL	Own	Mp-G-S	1/2 Own	4.55	IC	
7	Buick	40-90	1942	140	7.50/16	8-3 1/2 x 4 1/8	37.8	320.2	141-3800	6.25	37.6	CI	LB	Ala	AC	AC	S-C	Hay	DR	Del	P.OL	Own	Mp-G-S	1/2 Own	4.55	IC	
8	Cadillac-VB	40-60S	2090	127	7.00/16	8-3 1/2 x 4 1/8	39.2	346.0	135-3400	6.25	40.1	CI	Mor	Ala	No	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	1/2 Own	3.92	IC	
9	Cadillac-VB	40-62	1745	129	7.00/16	8-3 1/2 x 4 1/8	39.2	346.0	135-3400	6.25	40.5	CI	Mor	Ala	No	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	1/2 Own	3.92	IC	
10	Cadillac-VB	40-72	2670	139	7.50/16	8-3 1/2 x 4 1/8	39.2	346.0	140-3400	6.70	38.0	CI	Mor	Ala	No	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	1/2 Own	4.31	IC	
11	Cadillac-VB	40-75	2995	141	7.50/16	8-3 1/2 x 4 1/8	39.2	346.0	140-3400	6.70	38.6	CI	Mor	Ala	No	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	1/2 Own	4.58	IC	
12	Cadillac-16	40-90	5140	141	7.50/16	8-3 1/2 x 4 1/8	67.6	431.0	185-3600	6.75	43.1	CI	Mor	Ala	AC	AC	Str	Wal	DR	Del	P.Long	Own	Nb-Mec	1/2 Own	4.31	IC	
13	Chevrolet, Master 85	740	113	6.00/16	6-3 1/2 x 3 3/4	29.4	216.5	85-3400	6.25	34.0	CI	Var	CI	No	AC	Car	Var	DR	Del	P.own	Own	Nb-Own	1/2 Own	3.73	C		
14	Chevrolet DL & MDL	766	113	6.00/16	6-3 1/2 x 3 3/4	29.4	216.5	85-3400	6.25	36.7	CI	Var	CI	No	AC	Car	Var	DR	Del	P.own	Own	Nb-Own	1/2 Own	4.11	C		
15	Chrysler	C-25	995	122 1/2	6.25/16	6-3 1/2 x 4 1/8	27.3	241.5	108-3600	6.50	36.6	CI	Mor	AI	Pur	AC	Car	NS	AL	Wil	P.B&B	Own	Cb-UP	1/2 Own	3.90	IC	
16	Chrysler	C-26	1180	128 1/2	7.00/15	8-3 1/2 x 4 1/8	33.8	323.5	135-3400	6.80	43.7	CI	Mor	AI	Pur	AC	Str	NS	AL	Wil	P.B&B	Own	Cb-UP	1/2 Own	3.91	IC	
17	Chrysler	C-27	...	145 1/2	7.50/15	8-3 1/2 x 4 1/8	33.8	323.5	137-3400	6.80	39.9	CI	Mor	AI	Pur	AC	Str	NS	AL	Wil	P.B&B	Own	Cb-UP	1/2 Own	4.55	IC	
18	Crosley	...	A	362	80	4.25/12	2-3x2 1/4	7.2	38.9	15-4200	5.50	...	CI	For	CI	Pur	AC	Til	Rex	AL	AL	P.Ro	WG	St	1/2 Spi	5.14	C
19	De Soto	S-7	945	122 1/2	6.00/16	6-3 1/2 x 4 1/8	27.3	228.1	100-3600	6.50	37.6	CI	Mor	AI	Pur	AC	Car	NS	AL	Wil	P.B&B	Own	Cb-UP	1/2 Own	4.10	IC	
20	Dodge	D-14-17	855	119 1/2	6.00/16	6-3 1/2 x 4 1/8	25.3	217.8	87-3600	6.50	36.8	CI	Mor	Ais	Pur	AC	Str	NS	AL	AL	P.B&B	Own	Nb-UP	1/2 Own	4.10	IC	
21	Ford V8-60	1940	112	5.50/16	8-2.6x3.2	21.6	136.0	60-3500	6.60	28.1	AI	Dia	CS	No	Yes	Own	O	Own	P.Os	Own	m-Spi	3/4 Own	4.44	Tr			
22	Ford V8-85	1940	112	6.00/16	8-3 1/2 x 3 3/4	30.0	221.0	85-3800	6.15	36.2	CI	Dia	CS	No	Yes	Own	O	Own	P.Os	Own	m-Spi	3/4 Own	3.78	Tr			
23	Graham, Del. & Cus.	995	120	6.00/16	6-3 1/2 x 4 1/8	25.3	217.8	92-3800	6.65	...	CI	LB	Ais	No	AC	Car	Old	DR	Wil	P.Long	WG	Nb-UP	1/2 Spi	4.27	C		
24	Graham, Sc & Cus. Sc	1130	120	6.25/16	6-3 1/2 x 4 1/8	25.3	217.8	120-4000	6.65	...	CI	LB	Ais	No	AC	Car	Old	DR	Wil	P.Long	WG	Nb-UP	1/2 Spi	4.27	C		
25	Hudson Six & DeL. 6	763	113	(h)	6-3x4 1/8	21.6	175.0	92-4000	7.00	33.5	CI	Ge	Ais	No	AC	Car	Old	AL	Nat	Pw.Own	Own	Nb-Spi	1/2 Own	4.55	IC		
26	Hudson Sup. & CC. 6	870	118-125	(i)	6-3x4 1/8	21.6	212.0	102-4000	6.50	35.4	CI	Ge	Ais	No	AC	Car	Old	AL	Nat	Pw.Own	Own	Nb-Spi	1/2 Own	4.11	IC		
27	Hudson 8 & CC. 8	952	118-125	(k)	6-3x4 1/8	28.8	254.0	128-4200	6.50	40.9	CI	Ge	Ais	No	AC	Car	Old	AL	Nat	Pw.Own	Own	Nb-Spi	1/2 Own	4.11	IC		
28	La Salle	40-50, 52	1320	123	7.00/16	8-3 1/2 x 4 1/8	36.4	322.0	130-3400	6.25	40.3	CI	Mor	Ala	No	AC	Car	Wal	DR	Del	P.Long	Own	Nb-Mec	1/2 Own	3.92	IC	
29	Lincoln-V12	136-145	75.0/17	125	7.00/16	12-3 1/2 x 4 1/8	46.8	414.0	150-3400	6.38	38.5	CI	Mor	AI	Pur	AC	Str	Old	AL	Exi	P.Long	Own	m-Spi	FF Tim	4.58	C	
30	Lincoln-Zephyr	1940	1400	125	7.00/16	12-2 1/2 x 3 3/4	39.6	292.0	120-3500	7.20	43.0	CI	Dia	CS	...	AC	Own	O	Own	P.Os	Own	m-Spi	3/4 Own	4.44	Tr		
31	Mercury	1940	116	6.00/16	8-3-187x3 1/2	32.5	239.0	95-3600	6.15	33.8	CI	Dia	CS	...	AC	Own	O	Own	P.Os	Own	m-Spi	3/4 Own	3.54	Tr			
32	Nash-Lafay.	4010	875	117	6.00/16	6-3 1/2 x 4 1/8	27.3	234.8	99-3400	6.30	36.8	CI	Whit	Ais	No	AC	Car	Wal	AL	USL	P.B&B	Own	Nb-Mec	1/2 Own	4.10	IC	
33	Nash Amb. 8	4020	985	121	6.25/16	6-3 1/2 x 4 1/8	27.3	234.8	105-3400	6.00	35.4	CI	Whit	Ais	BS	AC	Car	Wal	AL	USL	P.B&B	Own	Nb-Mec	1/2 Own	4.10	IC	
34	Nash Amb. 8	4080	1195	125	7.00/15	6-3 1/2 x 4 1/8	31.2	260.8	115-3400	6.00	35.2	CI	Dia	Ais	BS	AC	Car	Wal	AL	USL	P.B&B	Own	Nb-Mec	1/2 Own	4.10	IC	
35	Oldsmobile	60	899	116	6.00/16	6-3 1/2 x 4 1/8	28.4	229.7	95-3400	6.10	37.8	CI	Whit	Aia	No	AC	Car	Var	DR	Del	P.B&B	Own	Rb-Mec	1/2 Own	4.11	IC	
36	Oldsmobile	70	963	120	6.50/16	6-3 1/2 x 4 1/8	28.4	229.7	95-3400	6.10	37.8	CI	Whit	Aia	No	AC	Car	Var	DR	Del	P.B&B	Own	Rb-Mec	1/2 Own	4.30	IC	
37	Oldsmobile	90	1131	124	7.00/15	6-3 1/2 x 3 3/4	33.8	257.1	110-3600	6.20	37.2	CI	LB	Aia	No	AC	Car	Var	DR	Del	P.B&B	Own	Rb-Mec	1/2 Own	4.30	IC	
38	Packard	110	975	122	6.25/16	6-3 1/2 x 4 1/8	29.4	245.0	100-3200	6.39	40.5	CI	Mor	Ais	No	AC	Str	Wal	AL	PO	Ps.Long	Own	Rb-Mec	1/2 Own	4.11	IC	
39	Packard	120	1146	127	6.50/16	6-3 1/2 x 4 1/8	33.8	282.0	120-3600	6.41	40.3	CI	Mor	Ais	No	AC	Str	Wal	AL	PO	Ps.Long	Own	Rb-Mec	1/2 Own	4.09	IC	
40	Packard	160-80	1632	127-38-48	7.00/16	6-3 1/2 x 4 1/8	39.2	356.0	160-3500	6.45	43.8	CI	Mor	Ais	...	AC	Str	Wal	AL	Wil	Ps.Long	Own	Rb-Mec	(b) IC			
41	Plymouth	P9	740	117 1/2	5.50/16	6-3 1/2 x 4 1/8	23.4	201.3	84-3600	6.70	34.6	CI	Mor	AI	Pur	AI	Car	NS	AL	AL	P.B&B	Own	Nb-UP	1/2 Own	3.90	IC	
42	Plymouth	P10	805	117 1/2	6.00/16	6-3 1/2 x 4 1/8	23.4	201.3	84-3600	6.70	34.8	CI	Mor	AI	Pur	AI	Car	NS	AL	Wil	P.B&B	Own	Nb-UP	1/2 Own	4.10	IC	
43	Pontiac 6	40-25	876	117	6.00/16	6-3 1/2 x 4	28.3	222.7	87-3520	6.50	38.2	CI	Mor	CNI	No	AC	Car	Var	DR	Del	P.In	Own	Rb-Mec	1/2 Own	4.30	IC	
44	Pontiac 6	40-26	932	120	6.00/16	6-3 1/2 x 4	28.3	222.7	87-3520	6.50	37.4	CI	Mor	CNI	No	AC	Car	Var	DR	Del	P.In	Own	Rb-Mec	1/2 Own	4.30	IC	
45																											

Tune-Up Specifications

Car Manufacturers and Supersede All Others Previously Published

Service Brake Make and Type	Steering Gear Make	Compression Pressure at Cranking Speed (Lbs.)	RINGS		VALVES								IGNITION						FRONT AXLE								
			Spark Plug		Piston Pin Diameter		Piston Pin Locked In				Head Diameter and Seat Angle		Operating Tappet Clearance		Intake Valve Opens Before or After T. C.		Breaker Points Gap (Ins.)		Timing		Crankpin Length (Ins.)		Camber (Degrees)		Toe-in (Inches)		
			Make and Type		No. and Width Comp.	No. and Width Oil	Piston Pin Diameter	Inlet (Ins.)	Exhaust (Ins.)	Inlet Seat Angle (Degrees)	Exhaust Seat Angle (Degrees)	Stem Diameter (Ins.)	No. of Degrees	No. of Flywheel Teeth	Inlet	Exhaust	Inlet Tappet Clearance for Valve Timing	Spark Occurs 'TC'	Crankpin Diameter (Ins.)	Capacity Crankcase (Qts.)	Dry	Caster (Degrees)	Line Number				
OM R	135 Ch-H-10	2-1/2 1-1/8	R	1 1/8	45	1 1/2	45	.279	.011H	.012H	.011	19B	...	.022	.025	4BT	...	Au A	1 1/4	1	3 1/2	15	1 1/4	1 1/8	1 1/2	1
BH S	112 AC-46	2-3/8 2-1/8	R	1 1/2	45	1 1/2	45	.372	.015H	.015H	++	13B	5 1/4 B	.015	.025	4B	1 1/2 B	Au A	2	1 1/2	8	12 1/2	3 1/2 + 1/2	-1/4 + 1/2	0-1/8	3 1/2 - 4 1/2	2
BH S	112 AC-46	2-3/8 2-1/8	R	1 1/2	45	1 1/2	45	.372	.015H	.015H	++	13B	5 1/4 B	.015	.025	4B	1 1/2 B	Au A	2	1 1/2	8	12 1/2	3 1/2 + 1/2	-1/4 + 1/2	0-1/8	3 1/2 - 4 1/2	3
BH S	114 AC-46	2-3/8 2-1/8	R	1 1/2	45	1 1/2	45	.372	.015H	.015H	++	14B	6B	.015	.025	6B	1 1/4 B	Au A	2	1 1/2	8	12 1/2	3 1/2 + 1/2	-1/4 + 1/2	0-1/8	3 1/2 - 4 1/2	4
BH S	114 AC-46	2-3/8 2-1/8	R	1 1/2	45	1 1/2	45	.372	.015H	.015H	++	14B	6B	.015	.025	6B	1 1/4 B	Au A	2	1 1/2	8	12 1/2	3 1/2 + 1/2	-1/4 + 1/2	0-1/8	3 1/2 - 4 1/2	5
BH S	114 AC-46	2-3/8 2-1/8	R	1 1/2	45	1 1/2	45	.372	.015H	.015H	++	14B	6B	.015	.025	6B	1 1/4 B	Au A	2	1 1/2	8	12 1/2	3 1/2 + 1/2	-1/4 + 1/2	0-1/8	3 1/2 - 4 1/2	6
BH S	114 AC-46	2-3/8 2-1/8	R	1 1/2	45	1 1/2	45	.372	.015H	.015H	++	14B	6B	.015	.025	6B	1 1/4 B	Au A	2	1 1/2	8	12 1/2	3 1/2 + 1/2	-1/4 + 1/2	0-1/8	3 1/2 - 4 1/2	7
BH S	155x AC-104	2(c) 2-5/8	F	1.88	45	1.63	45	.341	AA	AA	AA	TC015	.027	5B	...	Au A	2	2.46	2 1/2	7 24 1/2	(nn)	0 to + 1/2	3 1/2 - 4 1/2	5° 8'	8
BH S	155x AC-104	2(c) 2-5/8	F	1.88	45	1.63	45	.341	AA	AA	AA	TC015	.027	5B	...	Au A	2	2.46	2 1/2	7 24 1/2	(nn)	0 to + 1/2	3 1/2 - 4 1/2	5° 8'	9
BH S	170x AC-104	2(c) 2-5/8	F	1.88	45	1.63	45	.341	AA	AA	AA	TC015	.027	5B	...	Au A	2	2.46	2 1/2	7 24 1/2	(nn)	0 to + 1/2	3 1/2 - 4 1/2	5° 8'	10
BH S	170x AC-104	2(c) 2-5/8	F	1.88	45	1.63	45	.341	AA	AA	AA	TC015	.027	5B	...	Au A	2	2.46	2 1/2	7 24 1/2	(nn)	0 to + 1/2	3 1/2 - 4 1/2	5° 8'	11
BH S	180x AC-104	2(c) 1-1/8	R	1.50	45	1.37	45	.341	AA	AA	AA	6B015	.032	6B	...	Au A	2	2.00	1 1/2	11 30	N 1/2 - N 1	0 to + 1/2	3 1/2 - 4 1/2	5° 8'	12
OH O	AC-44	2-1/2 1-7/8	R	1 1/2	30	1 1/2	30	.340	.006H	.013H	.006	3B	...	.021	.040	5B	...	Au A	2 1/2	1 1/2	5 14	2 1/2 + 1/2	1 1/2 - 1/2	0-1/2	4 1/2	13
OH O	AC-44	2-1/2 1-7/8	R	1 1/2	30	1 1/2	30	.340	.006H	.013H	.006	3B	...	.021	.040	5B	...	Au A	2 1/2	1 1/2	5 14	2 1/2 + 1/2	1 1/2 - 1/2	0-1/2	4 1/2	14
LH G	145x AL-ATB	2-3/8 2-5/8	F	1 1/2	45	1 1/2	45	.340	.006H	.010H	.014	12B	...	.020	.025	TC	TC	Au A	2 1/2	1 1/2	5 18	Nito + 1	0 to + 1/2	0-1/2	4 1/2 - 5	15
LH G	155x AL-ATB	2-3/8 2-5/8	F	1 1/2	45	1 1/2	45	.340	.006H	.010H	.011	6B	...	.018	.025	TC	TC	Au A	2 1/2	1 1/2	6 24	Nito + 1	0 to + 1/2	0-1/2	4 1/2 - 5	16
LH G	155x AL-ALTB	2-3/8 2-5/8	F	1 1/2	45	1 1/2	45	.340	.006H	.010H	.011	6B	...	.018	.025	3B	...	Au A	2 1/2	1 1/2	6 24	Nito + 1	0 to + 1/2	0-1/2	4 1/2 - 5	17
HM R	90 AL-A5	2-1/2 1-3/8	P	1 1/2	45	1 1/2	45	.312	.006C	.007C	.006	20B	5 1/2 B	.020	.025	3B	1B	A	1 1/2	2	6-11	2	1 1/2 - 1/2	6 1/2	18		
LH G	145x AL-ATB	2-1/2 2-5/8	F	1 1/2	45	1 1/2	45	.340	.008H	.010H	.014	12B	...	.020	.025	2B	...	Au A	2 1/2	1 1/2	5 17	Nito + 1	0 to + 1/2	0-1/2	4 1/2 - 6	19
LH G	140x AL-ATB	2-1/2 2-5/8	F	1 1/2	45	1 1/2	45	.340	.008H	.008H	.011	6A	2 1/2 A	.020	.025	TC	TC	Au A	2 1/2	1 1/2	5 15	Nito + 1	0 to + 1/2	0-1/2	4 1/2 - 6	20	
LH G	105 Ch-H-10	2-3/8 1-5/8	F	1.28	45	1.28	45	.279	.011C	.011C	.013	9 1/2 B	3 1/4 B	.015	.025	4B	1 1/2 B	Au A	1.70	1.41	4 13	4 1/2 - 9	1/4 - 1	1 1/2 - 1/2	8	21	
LH G	100 Ch-H-10	2-3/8 1-5/8	F	1.53	45	1.53	45	.310	.011C	.011C	.013	TC	3 1/4 B	.015	.025	4B	1 1/2 B	Au A	2	1.75	5 22	4 1/2 - 9	1/4 - 1	1 1/2 - 1/2	8	22	
OH R	120 Ch-H-10	2-3/8 2-5/8	R	1 1/2	30	1 1/2	45	.341	.010H	.010H	.012	8 1/2 B	...	.018	.025	TC	TC	Au A	2 1/2	1 1/2	5 14	3-4	1	1 1/2 - 1/2	7 1/2	23
OH R	130 Ch-H-10	2-3/8 2-5/8	R	1 1/2	30	1 1/2	45	.341	.010H	.010H	.012	8 1/2 B	...	.018	.025	4 1/2 A	...	Au A	2 1/2	1 1/2	5 15	3-4	1	1 1/2 - 1/2	7 1/2	24
BH G	125 Ch-J-8-A	2-3/8 2(d)	F	1 1/2	45	1 1/2	45	.341	.006H	.006H	.010	2 1/2 B	...	.020	.032	TC	...	Au A	1 1/2	1 1/2	6 13	0 ± 1/4	1/2 ± 1/4	1/2 ± 1/4	3 3/8'	25
BH G	120 Ch-J-8-A	2-3/8 2(d)	F	1 1/2	45	1 1/2	45	.341	.006H	.008H	.010	2 1/2 B	...	.020	.032	TC	...	Au A	1 1/2	1 1/2	6 13	0 ± 1/4	1/2 ± 1/4	1/2 ± 1/4	3 3/8'	26
BH G	119 Ch-J-8-A	2-3/8 2(d)	F	1 1/2	45	1 1/2	45	.343	.006H	.008H	.010	2 1/2 B	...	.017	.032	TC	...	Au A	1 1/2	1 1/2	9 18	0 ± 1/4	1/2 ± 1/4	1/2 ± 1/4	3 3/8'	27
BH S	155x AC-104	2(c) 2-5/8	F	1.88	45	1.63	45	.341	AA	AA	AA	TC	...	.015	.027	5B	2 1/2 B	Au A	2 1/2	2 1/2	7 25	(nn)	0-1/4	1/2 - 1/2	5° 8'	28
OM O	105 Ch-7	2-1/2 2-5/8	F	1 1/2	45	1 1/2	45	.341	AA	AA	AA	21B	6 1/4 B	.020	.029	7B	2 1/2 B	Au B	2 1/2	2	12 32	1 1/2	1	1 1/2 - 1/2	7 1/2	29	
BH R	110 Ch-H-10	2-3/8 1-5/8	F	1.53	45	1.53	45	.311	AA	AA	AA	10 1/2 B	...	.015	.029	4B	1 1/2 B	Au A	2 1/2	1.75	5 27	1/4 - 1	1	1 1/2 - 1/2	3 1/2 - 4	30
BH G	100 Ch-H-10	2-3/8 1-5/8	F	1.53	45	1.53	45	.310	.011C	.011C	.013	TC	...	.015	.025	4B	1 1/2 B	Au A	2	1.75	5 22	4 1/2 - 9	1/4 - 1	1 1/2 - 1/2	8	31
BH G	110 AL-B7-A	2-1/2 2-5/8	F	1 1/2	45	1 1/2	45	.340	.015	.015	.015	21 1/2 B	...	.020	.025	TC	TC	Au A	2	1.42	6 19	0-N 1/2	1/4 - 1/2	1/4 - 1/2	4 1/2	32
BH G	125 AC-45	2-1/2 2-5/8	F	1 1/2	45	1 1/2	45	.372	.015	.015	.015	24 1/2 B	...	.020	.025	6B	1/2 B	Au A	2	1.42	6 16	0-N 1/2	1/4 - 1/2	1/4 - 1/2	4 1/2	33
BH G	110 AC-45	2-1/2 1-5/8	F	1 1/2	45	1 1/2	45	.372	.015H	.015H	.015	20B	6B020	.025	9B	1/2 B	Au B	2	1.24	7 17	0-N 1/2	1/4 - 1/2	1/4 - 1/2	4 1/2	34
H O	AC-104 (z)	2(g)	F	1 1/2	30	1 1/2	45	.340	.007H	.010H	.012	1B	...	.020	.028	6B	...	Au A	2 1/2	1 1/4	5 17	1 1/2 ± 1/2 (t)	(e)	1 1/2 ± 1/2 (t)	1 1/2 ± 1/2 (t)	38
H O	AC-104 (z)	2(g)	F	1 1/2	30	1 1/2	45	.340	.007H	.010H	.012	1B	...	.015	.028	8B	...	Au A	2 1/2	1 1/4	6 18	1 1/2 ± 1/2 (t)	(e)	1 1/2 ± 1/2 (t)	1 1/2 ± 1/2 (t)	39
H O	AC-104 (z)	2(g)	F	1 1/2	30	1 1/2	45	.340	AA	AA	AA	4B	...	.015	.028	5B	...	Au A	2 1/2	1 1/4	7 20	N 1/2 - N 1 (t)	(e)	1 1/2 - N 1 (t)	1 1/2 - N 1 (t)	40
LH G	145x AL-ATB	2-1/2 2-5/8	F	1 1/2	45	1 1/2	45	.340	.006H	.008H	.011	6A	2 1/2 A020	.025	TC	TC	Au A	1 1/2	1	5 14	Nito + 1	0 to + 1/2	0-1/2	4 1/2 - 5	41
LH G	145x AL-ATB	2-1/2 2-5/8	F	1 1/2	45	1 1/2	45	.340	.00																		

Motor Car Price, Weight and Body Table

Following are delivered prices at factory for cars with standard equipment and include all federal taxes with exception of Crosley, Ford, Lincoln, Lincoln-Zephyr, Mercury and Willys. Optional equipment, state or local taxes, transportation charges and finance charges are extra.

KING QUALITY THE COMPLETE PARTS LINE



KING QUALITY THE COMPLETE PARTS LINE

LEGALLY SPEAKING

by C. R. ROSENBERG, JR.

A lawyer's interpretation of Federal and local court decisions of interest to repairmen, presented each month

Work Too Much for Him

If an employe is injured on the job because the work was too much for him, is the employer legally and financially liable for the injuries thus sustained? An Indiana employe told his employer that his duties and hours of

work were too great for his physical and mental well-being, but was informed that it would be necessary for him to perform the same duties for the same number of hours. The employe was later injured on the job and sued his employer. The employer's failure either to reduce the working

hours or else provide additional help for the performance of the duties, was alleged to be "actionable negligence."

But the Federal court could not see it that way. Said the court:

"Our case comes to this: he is hired for a specified position. He learns that the hours of work and the type of work are too much for him and are affecting his health; but, knowing these facts, he continues with his labors. In thus continuing he assumed the risks incidental to his employment."

But the court pointed out that, in some circumstances, where the employer does not have enough men on a job, he may become liable for injuries to men who work on it.

"They are cases," said the court, "where the employer fails to provide adequate men to operate machinery or appliances and as a result of such failure, a dangerous instrumentality or an unsafe place to work is created and the injury occurs because of the danger in the work."

"Money Back" Guarantee

A "MONEY back" guarantee has no legal meaning, says the Supreme Court of Washington in a recent case.

The case was tried in a lower court, and the unsuccessful party appealed. The Supreme Court of Washington did not believe that the alleged "money back" promise was ever made in the case and said:

"Assuming, merely for the sake of argument, that some such expression was used, there is no evidence as to what was meant by the term, 'money back.' Obviously, it might have many different meanings and limitations, dependent upon the circumstances of the particular case. The court which tried the case endeavored to elicit from the parties what was meant thereby, but was unsuccessful.

"We likewise (meaning the Supreme Court of Washington) find nothing to enable us to fix any definite, precise, legal meaning upon the term, 'money back guarantee.'

Repairmen offered goods and equipment on a "money back guarantee" will do well to ask for a detailed explanation of just what that guarantee means and under what conditions it becomes effective.

Changing Contract

WHILE a repairman has but slight chance to avoid the consequences of a written contract or other document he has signed, the law does provide for the "reformation" of a contract signed through fraud, accident or mistake. A recent Federal case shows just how hard it is to get such relief once the contract has been signed.

In that case a business man contended that the contract he had signed did not carry out the terms of the
(Continued on page 40)

"CHAMP-ITEMS SHORT CUTS CERTAINLY SAVE ME TIME AND MONEY"

Re-CONDITIONING SHORT CUTS

for CHEVROLET

No. 955 Oil Regulator and Valve Silencing Cap stops smoking and reduces excessive oil consumption at valve guides. For all '35-'40 cars and trucks. List \$2.50 set.

for FORD

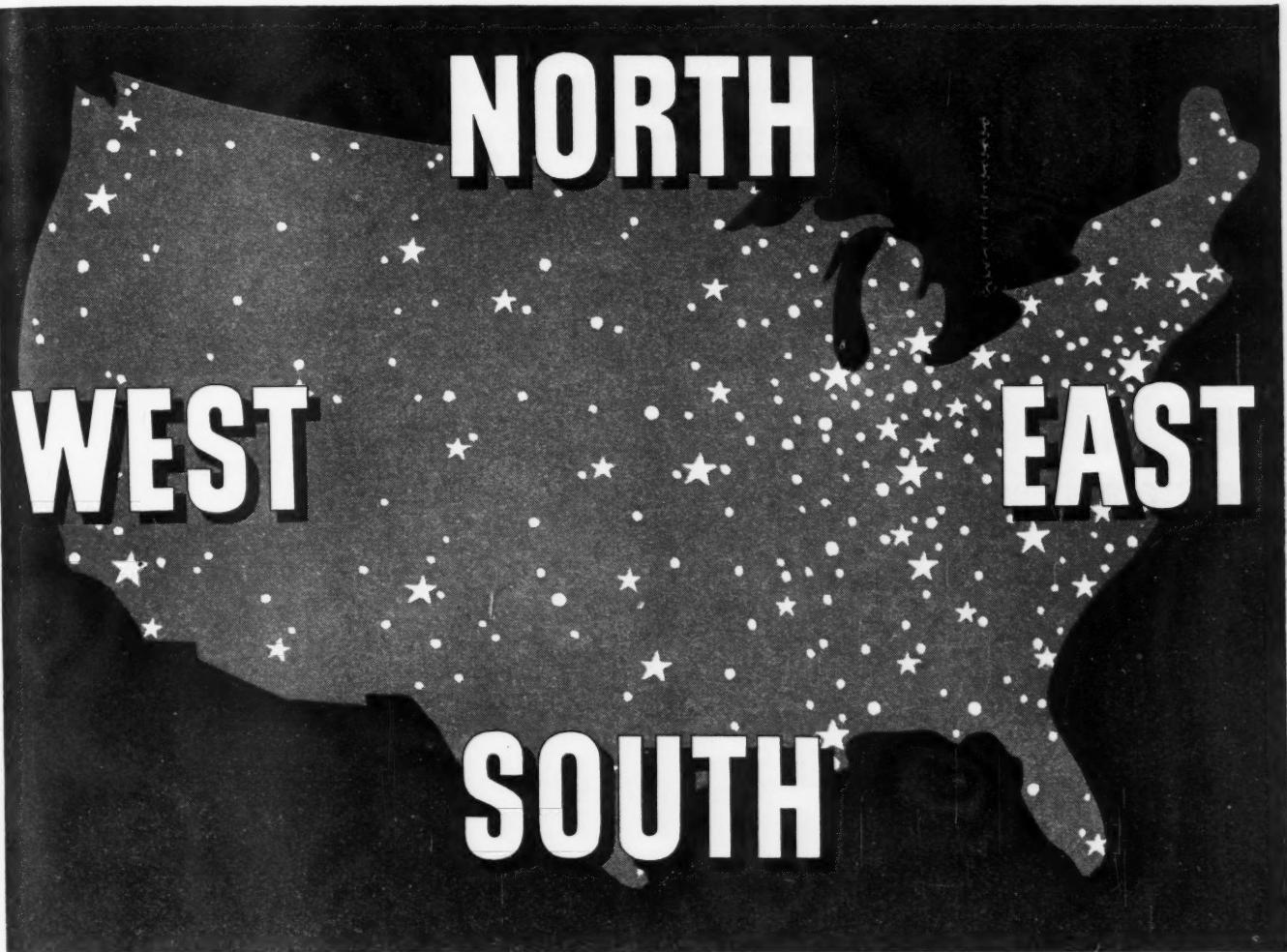
No. 978 Window Regulator Repair Kit Contains all necessary parts to repair Ford window lifts. List \$1.00 each.

for PLYMOUTH

No. 980 Improved Starter Pedal Return Spring for Plymouth—Dodge — DeSoto — Chrysler. List 15¢ each.

RE-CONDITIONING
CHAMP-ITEMS INC.
SHORT CUTS

ORDER FROM YOUR JOBBER
CHAMP-ITEMS, INC. ST. LOUIS, MO.



All over the map, in big towns and small, there's a fine opportunity with Chrysler and Plymouth!

ARE you taking the right road to future prosperity? Perhaps you, too, can build financial independence through a Chrysler and Plymouth dealership. The opportunity exists in small towns as well as large. Many of Chrysler's most successful dealers started business in a very small way.

A Market That Renews Itself!
Chrysler dealerships enjoy a remarkably steady business. The motor car has become so necessary a part of American life that replacement demand is steady . . . the market renews itself year after year.

Experience Not Essential!
Many prosperous Chrysler dealers changed to the Chrysler franchise from other walks of life. If you like mechanical things, have average business judgement, enjoy meeting people, you should be able to duplicate the successes of other Chrysler dealers.

THE WHOLE TRADE IS TALKING CHRYSLER!

Complete Coverage!

Chrysler dealers will tell you that there are two very important factors in their success. The complete market coverage of the Chrysler and Plymouth lines and the helpful interest of the Chrysler organization in every dealer's business. With a complete line of cars, ranging from the low-priced Plymouth, through medium-priced range, and up to the Chrysler Crown Imperial, everybody in town is the Chrysler dealer's prospect. The cooperation of the Chrysler factory embraces assistance with every phase of the dealer's operation . . . it is outstanding in the industry for its completeness.

* * *

*All prices delivered in Detroit including Federal tax, Transportation, State and local taxes, if any, and special equipment extra.

Learn today whether there is an opportunity for a Chrysler dealership in or near your town. Address Chrysler Corporation, Chrysler Sales Division, 12200 E. Jefferson, Detroit, Mich.

COMPLETE MARKET COVERAGE
—Every Buyer is Your Prospect!

Plymouth Roadking . . . one of a line of great new Plymouths at \$645* and up.	Chrysler Royal Sedan . . . a great big quality car for only \$995.
Plymouth Commercial Cars . . . \$585 and up . . . chassis and cab \$555.	Chrysler Traveler . . . one of eleven Traveler, New Yorker and Saratoga types, \$1095 to \$1450.
Chrysler Royal Coupe . . . one of 13 Royal and Windsor models, from \$895 to \$1350.	Chrysler Crown Imperial . . . Chrysler's Finest, three luxury styles, \$2245 to \$2445.

Legally Speaking

(Continued from page 38)

agreement he had made orally with the other party and that he had been induced to sign the written agreement on the fraudulent representations of the other party that the written contract actually embodied their oral understandings. He asked the court to "reform" the contract so that it would carry out the oral agreements which he alleged.

He was unable to prove the so-called fraud to the satisfaction of the Fed-

eral court, which dismissed his complaint.

"The burden," said the court, "is on the plaintiff (the business man) to establish that the written agreement does not correctly express the agreement as made, and in order to reform the agreement it is necessary to prove that the written agreement was entered into through a mutual mistake or by fraudulent knowledge and procurement by one party thereto."

"To authorize the reformation of written instruments, the evidence must be clear, cogent and convincing, for there is always a strong presump-

tion that the written instrument accurately sets forth the whole contract, and where fraud is charged, he who asserts it has the burden of proving it by clear, unequivocal and convincing evidence, because fraud is never presumed."

Which emphasizes the careful repairman's three common-sense rules for signing contracts and other papers:

1. Read every word before you sign;

2. Make sure you understand just what it means before you sign;

3. In case of doubt, consult your attorney before you sign, not after.



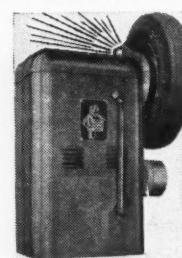
"NO SIR, not a dime! Up to a couple of years ago I never took a vacation...nights, Sundays and holidays I kept my nose to the grindstone.

"Then a Bear representative proved to me that the Bear DY-NAMIC Wheel Balancer would bring in more customers and make more money than any other piece of equipment I ever had.

"Man, was he right! Customers are sold when they see an unbalanced wheel wobble and jerk on the machine...See how the electric Neon Eye shows unbalanced spots...How wheels spin smooth and true after balancing. And jobs are coming in faster than ever

since Bear started National Advertising in TIME!"

BEAR JOBBER EASY-PAYMENT-PLAN Makes It Easy For You To Get This BEAR DY-NAMIC BALANCER. It operates Faster... You make more per job. Write for Big Free Catalog! Bear Mfg. Co., Rock Island, Illinois.



TIME
TO GET YOUR
BEAR SIGN UP

This "Stitch in Time" Can Increase your Tire Mileage as much as 50%

Unbalanced wheels are something to worry about! The chances are 100-to-1 that your car has them! There are two kinds of unbalanced wheels. Static and dynamically unbalanced. For today's driving speeds, wheels must be balanced both ways. To do this, Will Dammann created the Bear Dynamic Wheel Balancer. This machine shows you by means of a flashing NEON EYE the spot of unbalance. Not only does this save time, make your car steer true and eliminate excessive vibration which



BEAR DY-NAMIC WHEEL BALANCER
OFFICIAL AT INDIANAPOLIS SPEEDWAY

How Long for an Option?

WHEN a repairman is offered an opportunity to accept or reject a proposition, he is being offered what is usually called an option. Most offers of the kind specify a time limit within which he must accept or else lose the proposition.

But suppose no limit is mentioned! How long does the repairman have to take up the option, without danger of losing it?

"It is a well settled principle of law," said a California court recently, "that where the option agreement is silent as to the time for exercising the option, the optionee (the business man to whom it is offered) must exercise his option within a reasonable time. What is a reasonable time for the exercise of an option by the optionee depends upon the facts and circumstances of the particular case."

Tax by Classification

WHEN a State undertakes to impose taxes on businesses and occupations, it may "classify" those businesses and occupations for tax purposes and impose different tax burdens on different classifications. Such at least is the inference from a recent statement by a Federal court.

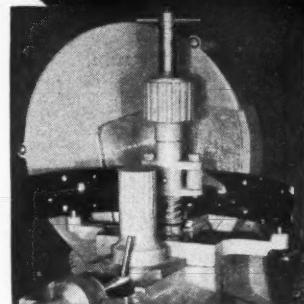
"States have power to discriminate," said the court, "between persons and callings by classifying them for purposes of taxation; and such classification need not be either logically appropriate or scientifically accurate. The rule of equality permits many practical inequalities."

May a peddler and an established merchant or business man be put in different "classifications" and differently taxed? Such a plan did not seem unreasonable to the court, which quoted with approval the following words of an earlier decision:

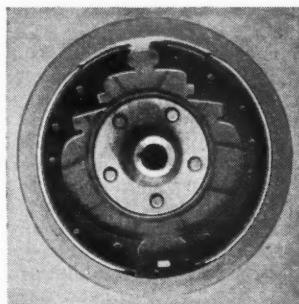
"It is said there is no sufficient ground for a distinction with respect to taxing the occupation, between the business of selling goods from a regularly established store and the business of selling them from a delivery wagon or truck. But there is an evident difference, in the mode of doing business, between the local tradesman and the itinerant dealer.

Hundreds of highway posters are now carrying Thermoid's famous safety slogan to millions of motorists.

*Thermoid
brings in the
customers*



An important step in Thermoid Precision Processing. Correctly installed Thermoid Brake Lining is burnished to the exact drum diameter, with the shoe mounted on the same points on which it is located on the backing plate.



Here's the result—immediate, perfect 100% lining-to-drum contact. It takes less time to adjust correctly burnished brake shoes, and they give positive, equalized brakes right from the very first brake application.

For quiet,
SAFER highways

Rely on your brakes
instead of your horn

Thermoid
Brake Linings

Thermoid
BRAKE LININGS

For QUICK, QUIET, EVEN STOPS insist on



...and helps you send 'em
away satisfied with
PRECISION PROCESSED BRAKE SHOES

"New car" brake performance on every brake job! That's exactly what happens when you use Thermoid Custom-Built Sets and the Precision Processing methods Thermoid makes available.

This means elimination of common complaints on brake jobs . . . no more expensive come-backs and free readjustments. It builds your reputation as a brake specialist. It saves you labor and time . . . so you can do more work and make more money. It equips you to turn out the up-to-date brake work that modern brakes require.

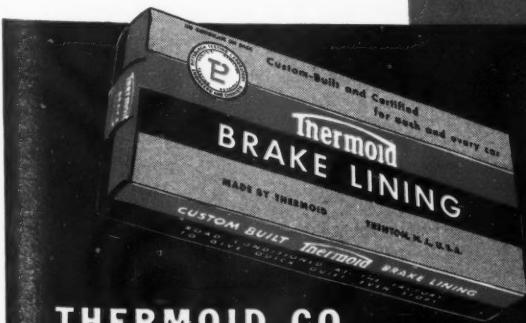
Thermoid has brought a new high to efficiency, speed and profits in brake service. Get the details now!

THERMOID BRAKE SHOE EXCHANGE SERVICE

Available in all important metropolitan areas. You simply exchange the old shoes at your Thermoid Jobber's for completely renewed shoes—checked, cleaned, painted, relined and Precision Burnished for immediate lining-to-drum contact.

DEALER'S "PAY-AS-YOU- PROFIT" EQUIPMENT PLAN

For smaller trading areas where Shoe Exchange Service is not available, Thermoid alone can supply the necessary information and equipment for Precision Processing, on a low-cost rental-purchase plan that gives you ownership within 18 months.



**THERMOID CO.
TRENTON, N. J.**

Thermoid
Custom-Built

BRAKE LINING SETS



Penna. Revitalizes

(Continued from page 19)

cial stations, and enforcing the law, as well as the Rules and Regulations laid down by the Pennsylvania Department of Revenue, is in the hands of the Pennsylvania Motor Police . . . administration of this portion of the law, comes under jurisdiction of the Department of Revenue . . . AND, it is the Secretary's mandatory duty to revoke appointments for certain violations.

That "POLITICS" has no place in a highway safety program, has been emphasized over and over, by Secret-

ary of Revenue William J. Hamilton. Secretary Hamilton and T. E. Traneau, director, Bureau of Highway Safety, have taken steps to eliminate it from the administration of motor vehicle equipment inspections.

Secretary Hamilton has made it definitely clear that he will brook no political interference in the inspection program, and that he will back up the state policeman's report on a station.

On the other hand, we have his assurance . . . and that of officials of the Pennsylvania Motor Police . . . that no action will be brought against any station, unless they are sure such a case would stand in court.

Although no specific period of sus-

pension is set forth in the law, it is understood that penalties inflicted will be sufficient to cause the "chisellers" to ponder before violating the Rules and Regulations.

The second step in the educational program deals with station operators and mechanics. Pennsylvania Automotive Association, in cooperation with State officials, motor club officials, Pennsylvania Motor Truck Association, safety organizations, local dealer associations and others, arranged a series of approximately 50 meetings covering all counties in the State, April 1-29, this year. As many as four meetings were held on one night, and the campaign proved so popular, those affected so hungry for information, attendance outnumbered all expectations, and interest displayed such as never before, proving the popularity of such a move.

At the meetings, Russel C. Jones, president; C. S. Klugh, manager of Pennsylvania Automotive Association, and others represented the association. Officials of the Pennsylvania Motor Police appeared, representatives of the Department of Revenue, safety organizations, motor clubs, local dealer associations and others interested in safety participated. All phases of inspection were covered, and station operators and mechanics were instructed in their part in the program.

It was brought out at the meetings, that up to this time, out of a total of approximately 9000 stations, more than 1700 have already been removed, through cancellation or suspension, in a campaign to eliminate careless and inefficient inspections, and that additional ones will be dropped from time to time.

Out of this educational program in so far as station personnel is concerned has been the development of ADVISORY COMMITTEES in various counties throughout the State. The plan was inaugurated in Allegheny County, where their committee has been functioning for several months. The idea of these committees, is to raise the standards of inspection through education of the operators, and assist enforcement men in "policing" the stations in the county.

Methods to promote a steady flow of inspections through an inspection period are also being studied, and various suggestions have been presented involving minimum expense. Many stations have successfully used the "penny postal card" method—direct-by-mail letters—or regular advertising, in an effort to avoid those last-minute jams, for the fact is brought out that it is during the closing days of a campaign when a "chiseler" thinks he can slip his car through for a 50-cent piece, and no repair work.

Yet to be accomplished remains one of the most important tasks—education of the public. They must be made to realize that they have a very important part in the inspection campaigns . . . that all inspection items are necessary for SAFE DRIVING—and that the individual motorist's safety on the highway is dependent upon the other fellow's car as well as his own.

No law is better than its administration, nor is any inspection system better than its supervision and the enforcement back of it. The motoring

(Continued on page 46)

BURD "Graf-Flox" PISTON RINGS

BURD "Kureslap" PISTON EXPANDER

BURD-LINDBLOOM Valve Packing

BURD PISTON RING COMPANY

Associate Company, Liberty Foundries Co.
ROCKFORD, ILLINOIS

ATLANTA, GA.
544 Spring St., NW
CHICAGO, ILL.
2236 S. Wabash
DALLAS, TEXAS
2705 Canton St.

KANSAS CITY,
MO., 1729 McGee
LOS ANGELES,
1500 So. Hope
MINNEAPOLIS,
21 S. 13th St.

NEW YORK, N. Y.
549 W. 52nd St.
PORTLAND, ORE.
1340 W. Burnside St.
ST. LOUIS, MO.
3225 Locust Blvd.

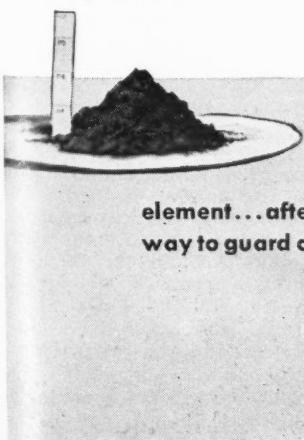
SAN FRANCISCO, SEATTLE, WASH.
540 McAllister St. 1525-10th Ave.
MONTREAL, TORONTO, 5,
732 St. Antoine 204 King St., E.
WINNIPEG, 126 Lombard St.

GET PROMPT SERVICE FROM ANY OF THESE BURD WAREHOUSES



**PUROLATOR
Kits for Ford...
Chevrolet... Mercury**

Contain replaceable-element type Purolator with all necessary fittings. For all Fords beginning with 1935 models, all Chevrolets beginning with 1937 models, all Mercury models. Every installation means a new customer for your Purolator elements! List Price for complete kit, only \$5.00.



This pile shows just half the dirt taken from a Purolator element...after only 8,000 miles. The safe, sure way to guard against the danger of dirty oil is to

**PUROLATOR
Replacement Elements**

Size for size, Purolator elements give greater dirt capacity than any other units on the market. In addition, Purolator's exclusive inside-to-out flow direction prevents accumulation of any dirt in the outside case. Easier to change! There's a Purolator element made to fit every automotive filter. Most sizes list at \$1.00.

**PUROLATOR
Type NE-1517
for Chrysler-built Cars**

Fits all Chrysler-built cars beginning with late 1933 models. Simply remove the factory-equipped EA $\frac{1}{2}$ or vertically-mounted E $\frac{1}{2}$ Purolator, and install the NE-1517, using original fittings and tubing plus one extra bracket. List Price, \$3.50. (Slightly higher on West Coast.)

MOTOR IMPROVEMENTS, INC., Newark, N. J.

*KEEP IT CLEAN
with
PUROLATOR*

Sales Talk

(Continued from page 22)

weighed in her mind, so if you want her business you'll have to explain her automotive needs so that they're just as understandable as the need for Susan's shoes. Then, and only then, can she make a wise decision.

If her neglect is deliberate it is probably because of two reasons: either "it's a nuisance," or "it costs too much." Let's consider these one at a time.

Mrs. Jones complains, "It's such a bother. When I take my car in it

means being without it, walking home, and usually a long wait when I go to get it. They never seem to have it ready on time."

A call and delivery service would answer half of Mrs. Jones' complaint. As to the delay, "Well," you say, "that can't always be helped. There are days when we're rushed and cars that come in on those days are certain to be kept longer than usual. Monday, for instance, finds business lining up at the door."

There's an answer for this, too. If Mrs. Jones brings her car in on Monday for a tune-up or something that isn't imperative, why not explain the situation to her? Tell her that you

don't want to keep her car any longer than is absolutely necessary, and that if she leaves it today you won't be able to give it the care and attention you'd like to. Ask if you couldn't pick it up on Tuesday or Wednesday, or some day that is mutually convenient, and that at that time you'll be able to give her really better service in less time. We're willing to wager she'll appreciate your consideration and will cooperate.

Another plan some shops have adopted to even out the week's business is to offer a slightly lower rate or a "special" for work done on Tuesday, Wednesday, or Thursday. Such offers have particular appeal to women who pride themselves on being good shoppers.

The other complaint—expense—runs something like this: "Repairs costs money, and when Jim takes the car in and has it fixed, he pays for it himself." True! But isn't it to her advantage to have her car fixed near home where your personal interest will insure her a first-rate job? And isn't your friendship worth something to her when she needs small adjustments and emergency service? If you point this out to her she'll want to come to you and she'll be able to talk hubby out of the necessary "where-with-all." We've yet to meet the woman who cried defeat on something she really wanted, so it's up to you to make your services seem desirable to her.

If neglect isn't deliberate it is due to ignorance. This ignorance may mean that the lady doesn't know that any trouble exists, or it may mean that while she knows there's something wrong, still she doesn't realize the danger of letting it run a while. If women really knew when their wheels were out of alignment, and what that meant, if they really knew when the clutch was slipping; if they knew when any one of a dozen things went wrong, and what neglecting these might mean in dollars and time, then, well—we wouldn't be writing this story.

But women don't know these things. They've got to be educated to caring for their cars just as they've been educated to caring for their hair, and for their hands, and for their homes. They've got to be sold, and by sold we don't mean high-pressured, but convinced—convinced that they are helping themselves, and saving themselves a great deal of trouble and money.

We all have to be sold on anything new. We've had to be educated to the use of electricity, hardwood floors, the automobile itself. And as we have had to learn the use of these things, in the same way we've had to learn to care for them.

Since men were the first to drive automobiles, men were the first to learn automotive maintenance. But women are driving now, and now women must learn. Several national magazines are doing educational work along this line through the medium of their editorial pages.

State motor vehicle departments are instituting campaigns for safer cars which really means greater car care.

Parts manufacturers are constantly
(Continued on page 48)

RING SPECIALISTS DEPEND ON WEL-EVER

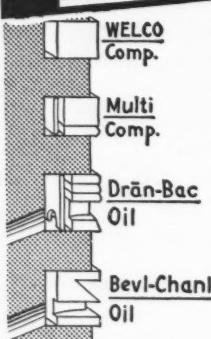
"*Guesswork is out . . .*



I Have to
K N O W

*-I
depend
on*

"Drān-Bac 'H' Sets"



You can depend on "H" Sets to lick practically ANY ring job! "H" Sets are Engineered Sets . . . individualized to the motor indicated on the Set package. They produce a job smooth and free-running. No drag, and practically no "breaking in" period.

Flexible, Full of Life!

"H" Sets are flexible, full of pep. They stop oil pumping, blow-by and permit liberal cylinder wall lubrication and actually s-l-o-w-d-o-w-n cylinder wall wear.

Licensed under Pat-
ent No. 2148997.

"H" Sets Are Reputation Builders!

Ring Specialists everywhere depend on "H" Sets. They stay young longer! And your profit on the job stays "put." No comebacks. Your Jobber has "H" Sets or can get them. Jobbers; Ring Specialists: Send for samples of "H" Sets. Also—

Wire or Write for Our Proposition!

Your Territory
may be open!

WEL-EVER
TRADE MARK

THE
WEL-EVER
Piston Ring Co.
TOLEDO, OHIO

DEALER'S NAME

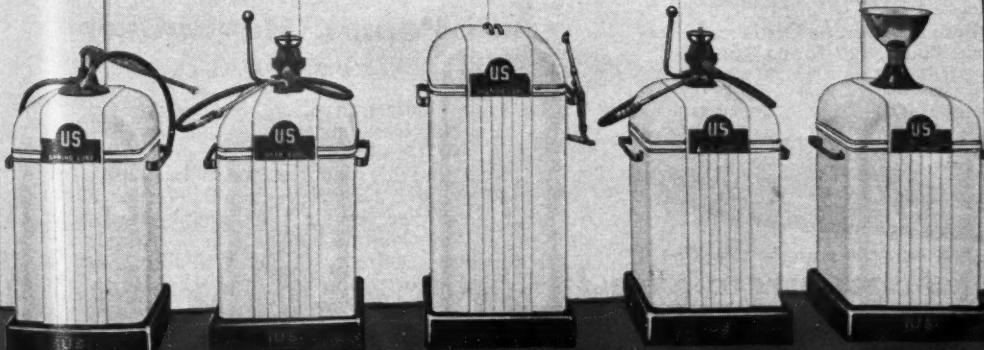


A Perfect Match in Looks and Action...
**U. S. BACKGROUNDS AND
LUBRICATING EQUIPMENT**

The beautiful new U.S. backgrounds, with their stylish rounded corners, blend in perfectly with U.S. lubricating equipment. This combination makes the outstanding lubricating "match set" on the market. U. S. backgrounds are all metal construction finished in beautiful baked ivory enamel and are 4 inches thick, which displays the equipment in a most outstanding manner.

THE U. S. AIR COMPRESSOR CO.
5300 HARVARD AVENUE • CLEVELAND, OHIO
Air Compressors • Greasing Equipment
Hydraulic Lifts

DEALER'S NAME



Merchandising Aids

(Continued from page 32)

completed a 96-page catalog containing dimensional data on all types of ball bearings, tapered roller bearings, straight roller bearings, thrust bearings and ball bearing pillow blocks. The mounted bearing section also includes machine units, flange mountings, take-up units and hanger bearings. The engineering section contains information that designers and maintenance men alike will find useful. Check "H" on the post card.

A new, complete wall chart listing all recent models of many standard

makes of cars, trucks and motors together with their piston ring requirements has just been issued for Ramco 10-Up Spiro-Seal piston rings and H. O. piston expanders. Ramsey Accessories Mfg. Corp., 3700 Forest Park Blvd., St. Louis, Mo. Check "J" on the post card for your copy. It's free!

A combined muffler catalog and merchandising booklet has been issued by Aluminum Industries, Inc., Cincinnati, Ohio. The common causes of carbon monoxide gas accidents are listed, and a 6-step method is outlined by which the service man can quickly test the exhaust system. The booklet also illustrates the merchan-

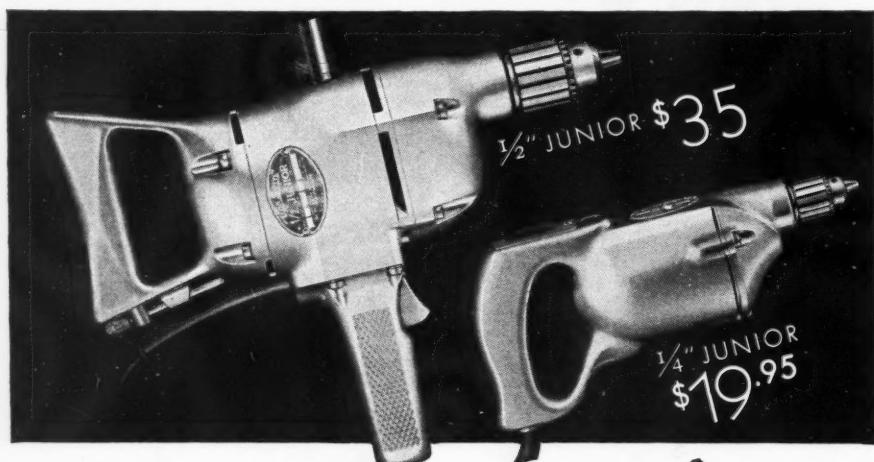
dising helps available to service stations for use in developing muffler business, and catalogs the complete line of Permite mufflers. A check in the "K" square will bring you a copy.

Automotive reconditioning performance reports are contained in a booklet published by Magnus Chemical Co., Inc., Earwood, N. J., outlining improvements and economies effected by the use of properly selected cleaners for motors and chassis, bodies, sludge and gum control in motors, radiators, floors, etc. You'll find it helpful. Check "L" on the post card.

Homestead Valve Mfa. Co., Coraopolis, Pa., has a new catalog folder describing their new high pressure Jenny steam cleaner. Check "M" on the post card.

The display pictured here is offered by Purolator to assist the dealer in selling the Economy Model NE-1517 replaceable element Purolator that retails for \$3.50. Refill element N-15

Van Dorn Steps Out with 2 New Junior Drills



These two New Van Dorn Junior Drills offer you the best tool value on the market today! A few years ago you couldn't obtain these features for twice the price:

Lighter and shorter than former models . . . close-coupled construction for better balance . . . built so you can drill in tight spots . . . oil-less bearings . . . threaded chuck . . . cord protector and clamp . . . new motor with 20% more power and 40% more torque on the 1/2" Junior . . . removable commutator end cover on the 1/2" Junior.

The Van Dorn Juniors are great all-around tools and when used in a bench drill stand their usefulness is greatly increased. The No. 40 Drill Stand illustrated at right converts the 1/2" Junior into a sturdy drill press for heavy duty and precision drilling. There are Van Dorn Stands for any Van Dorn Drill, in Bench, Post or Pedestal models.

Ask your Jobber to tell you about these new Junior Drills and Stands or write to: Van Dorn Electric Tools, 727 Joppa Road, Towson, Md.



"Van Dorn"

(DIV. OF BLACK & DECKER MFG. CO.)

THE "RED HEADED" PORTABLE ELECTRIC TOOLS

Penna. Revitalizes

(Continued from page 42)

public and official station proprietors have evidence of the fact that William J. Hamilton, Secretary of Revenue, and his deputies mean business; further, that the Pennsylvania Motor Police, under the capable leadership of Commissioner Lynn G. Adams and his deputy, C. M. Wilhelm, mean to enforce the law and the Rules and Regulations.



"I use Genuine
Ford Parts"

"I'M GOING to stock up on Genuine Ford Parts because when Ford owners need repairs on their cars and trucks, that's what they want. They look for a place that uses Genuine Ford Parts. They want replacements just as good as the original parts.

"I like to work with Genuine Ford Parts. They fit right the first time, no reworking and fitting to do. And I can depend on Genuine Ford Parts to stand up. It pays a man to use good materials—helps his reputation.

"Believe me, I'm going to use and boost the use of Genuine Ford Parts to all my Ford customers."



(Ask your Ford Parts Distributor about the Genuine Ford Parts sign)

FORD MOTOR COMPANY SERVICE DEPARTMENT
DEARBORN, MICHIGAN

Swanson Killed In Midget Upset

Bob Swanson, the race driver whose life was saved a year ago May 30 by Chet Miller, died recently in Perrysburg, Ohio, of injuries received when his midget racer turned over during a qualifying run.

Swanson, 27, finished sixth in this year's 500-mile race at Indianapolis. It was Swanson's car that caused a fatal crash in the Memorial Day race a year ago when it spun at the start of the back stretch, then broad-sided. Floyd Roberts, the 1938 winner, who was just behind, was killed when his car turned over. Swanson was thrown

into the center of the track and Chet Miller, avoiding Swanson, wrecked his machine and spent six months in a hospital.

Sales Talk

(Continued from page 44)

doing consumer advertising, and what is that, but consumer education?

Now it is up to you service men to tie up with this printed theory and show the women how it applies to them. You've got to tell the lady who drives in with trouble, just what that trouble is. If she complains that her motor is sluggish, bucks, and is noisy, and you say, "Madame, your motor

needs tuning up," that strikes a familiar note. She replies, "Oh, yes, I read about that. I guess that's what it does need."

Others have paved a highway for you, now it is up to you to ride on it. Of course, this sort of selling takes time—a lot more time than it takes to satisfy a great many men who come in, and you may not want to put that much time into it. But we say again—if you want more business, the women who drive make up a vast field of opportunity, and a field that is ready to be served!

An Extra Mile

(Continued from page 15)

should be carefully checked on a cam angle tester or an oscillograph. If the test shows a variation in dwell it indicates that a new set of points is needed due either to worn points or a worn rubbing block on the breaker arm. The spark advance will also show on the tester, and will indicate either weak governor weight springs or a leaking diaphragm in the vacuum advance mechanism. These conditions, of course, should be corrected.

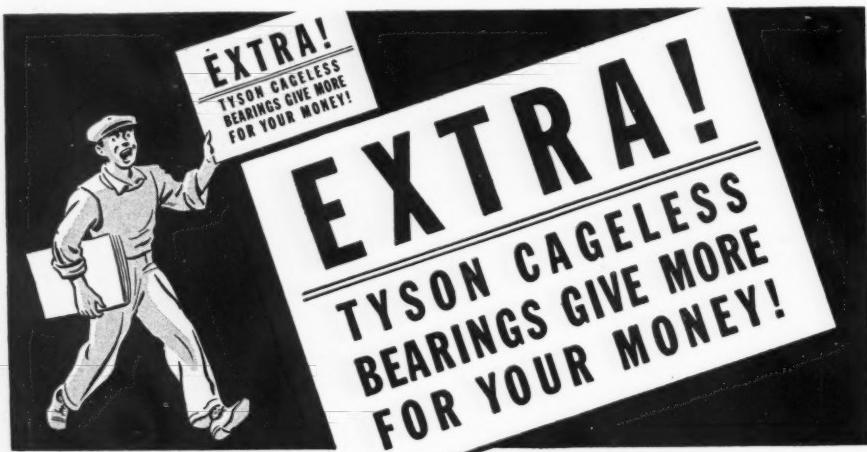
Ignition timing is one of the most important points effecting gasoline economy, and care should be taken to be sure that it is set at the point of greatest advance consistent with acceptable performance. A neon timing light offers a very satisfactory method of setting the ignition timing when the mark on the flywheel indicates the best ignition point considering the grade of fuel being used. Improvements in the quality of gasoline during the past year or so have made obsolete the timing marks on cars that are two or three years old.

It is possible to properly set the ignition timing on those cars to get the most out of the improved gasoline by using the following method: jack up the rear wheels, place the transmission in high gear and remove every other spark plug wire from the plug. Start the engine and set the hand throttle to register 35 m.p.h. on the speedometer. Then watch the speedometer and have another mechanic shift the distributor to the point where the speedometer registers the highest miles-per-hour, and lock the distributor in that position. This will be the point at which the ignition should take place when that grade of gasoline is being used.

The operation of the manifold heat control valve in the "hot spot" of the manifold should be checked to be sure that it is free and is opening fully when the engine is warm. If it does not open fully, it will have a tendency to set up a back-pressure in the manifold and effect top speed and also fuel economy. The same is true of the muffler and tail pipe—if there is any obstruction to the free flow of exhaust gas a back-pressure will be set up and top speed and gasoline economy will be effected.

Checking the carburetor is the last operation on the list, after the foregoing points have been checked and corrections made. A combustion analyzer is the instrument used to check the operation of the carburetor

(Continued on page 52)



EXTRA CAPACITY—Tyson's average of one-third more rolls means one-third more load-carrying capacity.

EXTRA LIFE—Tyson Cageless has twice the life of conventional bearings. And there's no cage to fail prematurely.

EXTRA RIGIDITY—Tyson has the extra rigidity necessary in gear mountings, particularly.



For Tough Jobs . . . Try Tyson

Cageless FOR HARD SERVICE Cage-type FOR REGULAR SERVICE

Tyson

TYSON ROLLER BEARING CORPORATION, MASSILLON, OHIO

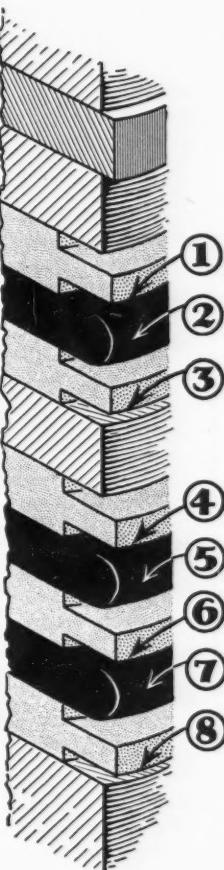


FORE! Yes, four or five times as many wiping edges as ordinary rings, places Simplex "LL" Rings on a par with any other known method of reconditioning by providing positive, predetermined oil control. Reconditioned the Simplex way, every stroke of the piston means a perfect hole-in-one without scuffing or slicing---the alternated softer segments of the "LL" Ring assure cylinder wall protection.

Link up with a winner---when you are ready to tee off on the next ring job, call your Simplex distributor.

SIMPLEX PRODUCTS CORP.
3890 KELLEY AVENUE • CLEVELAND, OHIO

MULTIPLE WIPING EDGES



For quicker seating and longer life, segments of different degrees of hardness are alternated in the groove. The softer, deeper segments wear down while the ring is seating, protecting the cylinder wall. The tougher, hardened sections carry-on after the seating, for long life.



SIMPLEX "LL" PISTON RINGS

Do a better job - give 'em "LL"!

An Extra Mile

(Continued from page 48)

throughout the entire speed range by checking the air-fuel ratio.

To obtain maximum economy it is necessary to sacrifice power, but a point can be reached at which the power sacrifice is not great enough to seriously interfere with general performance. From the chart shown on page 20, it will be seen that an air-fuel ratio of 15 lb. of air to 1 lb. of gasoline is the ratio which produces maximum economy. Such a ratio, however, might prove to be a little too lean for easy starting and

satisfactory idling. A slightly richer mixture is more desirable for starting and idling—about 12.5 to 13—particularly since that ratio is the one at which the maximum power output of the engine is obtained.

It is desirable, therefore, to attempt to obtain an air-fuel ratio of approximately 12.5 lb. of air to one pound of gas for the idle ratio, and a ratio of approximately 15 to 1 at an engine speed of 1000 r.p.m. under load, which is equivalent to approximately 30 miles per hour road speed. As mentioned above, this 15 to 1 ratio is the point at which the power output has begun to fall off, but the loss is not great enough to make a noticeable difference in general performance.

If it is impossible to arrive at this ratio it means that the carburetor will have to come off and be checked for worn jets, obstructions in the gas and air passages, worn throttle valve shaft, worn or incorrect metering rod, worn needle valve adjusting screw, incorrect float height, defective accelerating pump by-pass valve or any other point that would effect efficient carburetor operation.

The car should also be checked for dragging brakes, incorrect wheel alignment, and particularly for correct tire inflation. Under-inflated tires create increased rolling resistance and have a direct effect on gasoline economy.

Cylinder Head Puller

The National Machine Tool Co., Jackson, Mich., has added to its line of service tools a new puller for removing aluminum cylinder heads from Ford V-8 85 h.p. engines. The new tool consists of two complete puller units that bridge the cylinder head

Genuine NIEHOFF Products
AUTOMOTIVE ELECTRICAL SERVICE PARTS

SS 18 SERVICE STOCK

Plus Our Technical Bulletin Service and Sales Helps

Display Stand is 24" wide, 9 1/4" deep and 55" high overall—of sturdy all-welded, steel construction, set up ready for service. Beautifully finished in bright orange duco, with attractive metal sign at top and 4 shelves for systematic and attractive display of ignition parts stock.

ACT NOW and take advantage of this unusual combination Deal that will help stimulate your sales and increase your profit. MAIL COUPON BELOW.

To get you acquainted with NIEHOFF APPROVED QUALITY IGNITION PARTS and to enable you to share the experience of hundreds of repair shops and garages that are cashing in on this fast-moving parts line, we give you this attractive display stand ABSOLUTELY FREE with the purchase of a well-rounded stock of active moving parts, at a very small investment. Stock will enable you to service all popular makes of cars. In addition, we will give you without cost a most valuable Tune-Up Chart and other sales helps.

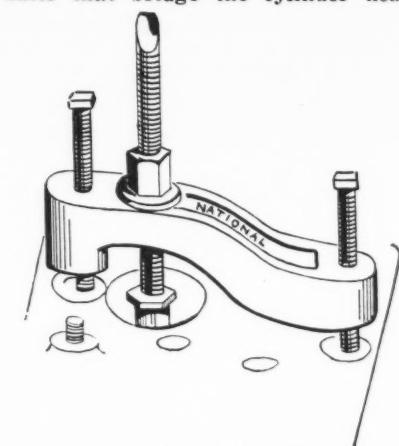
If you will qualify for our Service Agreement through your local Jobber, you will receive our technical bulletin service containing the latest authoritative data on motor Tune-Up. DON'T DELAY—ACT NOW!

Mail the COUPON TODAY for full details and learn how easily you can obtain this Profitable Combination Deal that will put EXTRA DOLLARS in your pocket.

MAIL COUPON TODAY

C. E. NIEHOFF & CO.
4919 Lawrence Ave., Chicago, Ill.
Please send full details telling how I can get
this display stand FREE.

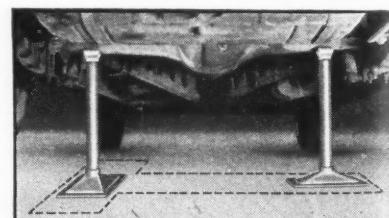
NAME _____
ADDRESS _____
CITY _____
STATE _____
LOS ANGELES, CALIF.



and rest on the studs. By turning alternately on four adjusting end screws and two thrust nuts, pressure is applied evenly at six points. An outstanding feature of the tool is a novel holding fixture which secures a solid, slip-proof grip on the inside of the head, and cannot injure the spark plug threads.

Safe-T Stands

Hein-Werner Motor Parts Corp., Waukesha, Wis., has introduced Safe-T non-adjustable stands for shop use under cars and trucks. They insure the safety of the mechanic working on the job, and in addition make it unnecessary to tie up the service jack



while the job is being done. Safe-T stands are available in either 5 or 10 ton capacities, and range in height from 18 in. to 24 in. The 5-ton stands have a list price of \$3.60 per pair, and the 10-ton stands are \$6.60 per pair.

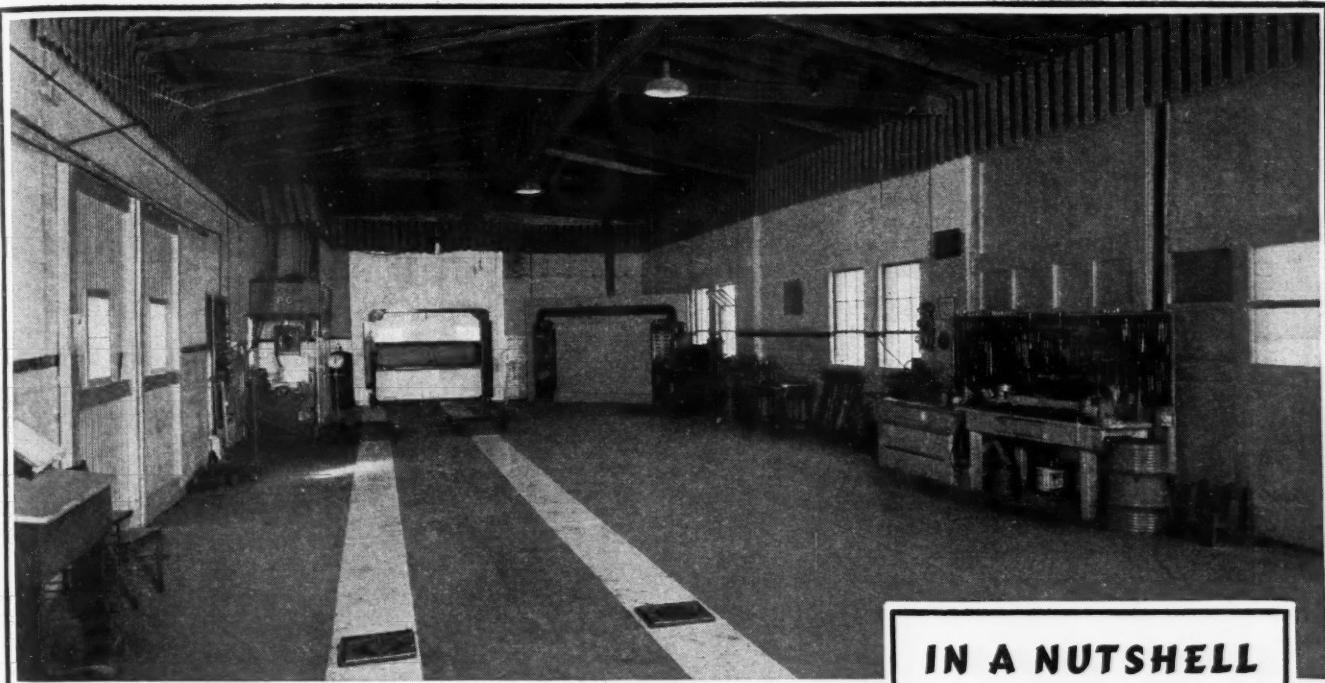
C. E. NIEHOFF & CO.
4919 LAWRENCE AVE., CHICAGO, ILL.

BRANCH: 1342 S. FLOWER ST.

When writing to advertisers please mention Motor Age

MOTOR AGE, July, 1940

An \$18,000 BUILD-UP on a \$79 MONTHLY PAYMENT



EL PASO MAN USES AEP TO START OWN BUSINESS WITH MODERN EQUIPMENT

IN November 1937, Dave Hill quit the job he had held during his two years residence in El Paso, Texas and set himself up in his own business . . . DAVE HILL AUTOMOTIVE SAFETY SERVICE.

It took ambition—and confidence—but *very little cash*—because he used the AUTOMOTIVE EQUIPMENT PLAN to finance the purchase of the modern equipment he needed.

With a down payment of \$403 he was able to install 11 selected items of equipment of a total value of \$2084. His monthly payment was \$79. *One single piece* of the new equipment produced more than enough revenue to pay for all. From nothing at all, he built up a thriving business—all his own—grossing \$1500 a month.

MODERN EQUIPMENT WILL PAY YOU

The Automotive Equipment Plan will help you increase your volume and your profit with very little initial investment. Let's tell you how. Ask your AEP jobber—or mail the coupon now.

IN A NUTSHELL

BENCH GRINDER
TRUCK BRAKE DRUM LATHE
BRAKE TESTER
MOTOR ASSEMBLER
H. L. TESTER
PNEUMATIC RIVETER
AUTOMATIC JACK
PRESSURE BLEEDER
and other equipment

Distributor:
CAR PARTS DEPOT, Inc.
Salesman: BOB BOOTH



INSURANCE INCLUDED

COMMERCIAL CREDIT COMPANY

Commercial Bankers

★ Modernize your shop through AEP financing—small monthly payments—low cost—full insurance—one simple contract ★

MAIL
THE
COUPON
NOW!

GET IT ON TIME—PAY OUT OF PROFITS

COMMERCIAL CREDIT COMPANY, Baltimore, Maryland

Put me in touch with a local AEP jobber who can give me full details.

Name _____

Address, City & State _____

Du Pont Adds New Products

From E. I. du Pont de Nemours & Co., Wilmington, Del., comes the announcement of three new products of interest to the automotive trade.

For removing bugs and bug residue from automobile finishes, the Du Pont No. 7 chemical specialties line now includes "Du Pont Bug Remover." This product is a powder which, when sprinkled on a damp cloth and rubbed on the surface, cleans away old dried bug spots as well as new bug deposits without softening, scratching or injuring the car finish. It may also be used for cleaning windshields and

chromium-plated grilles. The powder is packed in a 6-oz. shaker-top container.

"Dissolvo" is a new concentrated degreasing solvent with grease emulsifying properties, for cleaning garage floors, grease pits, driveways, motors, chassis, auto parts, tools and garage equipment. In use it is diluted with varying amounts of kerosene or fuel oil. It is described as non-inflammable and as harmless to metals.

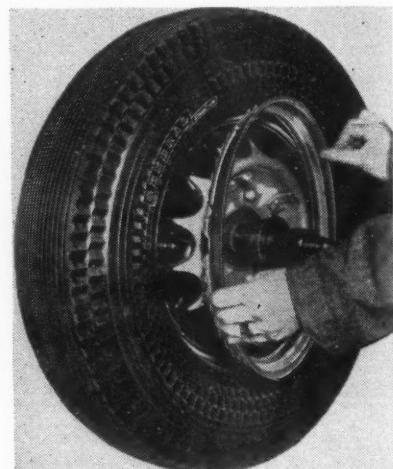
A powdered rust inhibitor is the third addition to the line, and is known as "Du Pont Anti-Rust." Intended as a preventative compound suitable for all automotive cooling systems. Used after the cooling sys-

tem has been cleaned, "Du Pont Anti-Rust" is marketed in a "one-dose" aluminum foil package with a semi-perforated top for easy installation.

Kraft Wheel Balancing

A new system of wheel balancing which places the balance weight behind the wheel trim ring has been developed by The Kraft System, Akron, Ohio, and has been endorsed and accepted by The General Tire & Rubber Company of Akron.

The Kraft lead is rubber coated and



Give Your Customers a Treat!

When you replace front wheel, differential or rear axle bearings, be sure to use Link-Belt Shafer Roller Bearings. They are certain to give your customers greater satisfaction because they have the extra load carrying capacity that assures top performance. Their integral perfect alignment between rollers and raceway is your positive protection that every job will be a credit to your workmanship. Ask your jobber, today!



Made by the makers of the famous Silver-streak Silent Timing Chain!

LINK-BELT COMPANY
519 N. Holmes Ave., Indianapolis, Ind.
Warehouses in all principal trading centers

is delivered as a continuous strip wound on a reel. It is marked in 1-oz. lengths, and the operator cuts off the amount needed. This lead is placed on the inside of the wheel trim ring, held in place by the cleats on the ring.

In addition to getting the balance weight out of sight, it is claimed that a better job of balancing is possible because the weight is located nearer the center line of the wheel and tire assembly. The weight is securely fastened and cannot slip out of place or fly off the wheel.

Battery Cable Assortment

A new Nokrode battery cable combination that is said to contain cables for popular cars only is announced by Belden Mfg. Co., 4689 W. Van Buren St., Chicago, Ill. The assortment includes nine fast selling numbers which will service most cars. An attractive display rack to carry this assortment, which has space for additions, is included free with the purchase of the assortment.



LINK-BELT
SHAFER

ROLLER BEARINGS

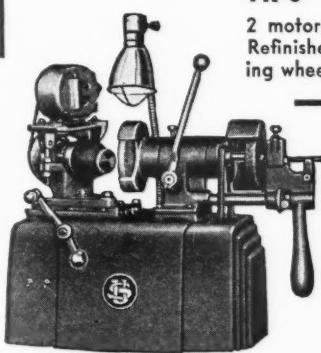


GET YOUR SHARE
OF THE PROFITS
BUILD UP YOUR
QUALITY REPUTATION

YOU can do better work...quicker...with lower costs to yourself when using UNITED STATES ELECTRICAL TOOLS. It's good business in dollar-volume as well as in augmenting your reputation for reliability and quality.

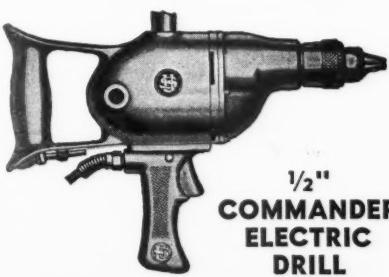
VR-6 VALVE REFINISHING MACHINES

2 motors, one for grinding wheel, one for chuck spindle. Refinishes valves any angle from 30° to 60°. Ball bearing wheel spindle. Six-point contact chuck.



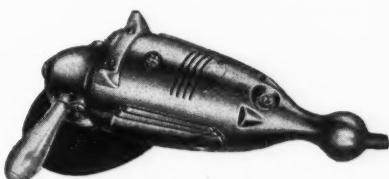
**Model 2000 VALVE SEAT
GRINDING SET**

Speedy...Accurate...Simple. Will recondition any type valve seat. New high speed driver for heavy duty service. Recommended for Diesel, truck and tractor valve jobs.



1/2"
COMMANDER
ELECTRIC
DRILL

Ball bearing, permanently lubricated. Powerful general purpose drill.



7" **PORTABLE ELECTRIC**
SANDER

High speed. General purpose sander. For metal finishing, removing scale and rust, smoothing welds.



1/4" **AUTOMATIC**
ELECTRIC DRILL

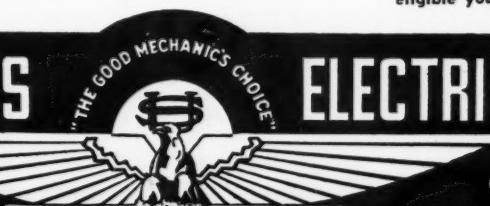
Ball bearing, permanently lubricated. Make or break thumb switch.

For the right electrical tool for any job... see new Catalog No. 55

• We favor adequate preparedness for National Defense and recommend enlistment for eligible young men.

THE UNITED STATES

CINCINNATI,

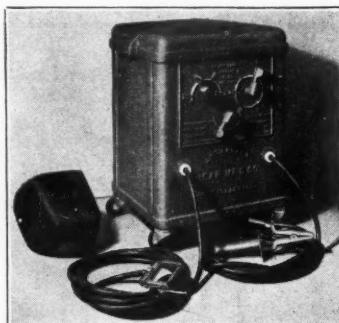


ELECTRICAL TOOL CO.

OHIO, U.S.A.

Arcmaster Welder

The Bear Mfg. Co., Rock Island, Ill., has announced a new A. C. Arcmaster welder, featuring a unique multiple coil transformer design that assures an even flow of current to the electrode. The manufacturer claims that this four coil transformer construction with reactance control makes possible a uniform and constant welding voltage with calibrated amperage from lowest to highest output. Built for heavy duty operating conditions, this all-metal unit is constructed to withstand heat created under constant usage, prevent insulation breakdown and avoid complete burnouts. Made



in three models with ranges of 10-200 amperes and 10-300 amperes. All models have 220, 60-cycle voltages.

You Wouldn't Use 18 HAMMERS to Drive ONE Nail!

Why Buy 18 Lubricants WHEN ONE DOES THE JOB?

● And that ONE is Valvoline X-18. It's the all-season, all-purpose gear lubricant that replaces 18 others!

Of course, X-18 saves money on your lube inventory. But that's not all. X-18 also saves you money by speeding up lube jobs because of fewer gun and drum changes. It

eliminates seasonal carry-over stock losses, too, because you make Spring and Fall change-overs from the same drum.

Get all the profit out of your lube business. Get Valvoline X-18! Available in 5-lb. tins, 25-lb. pails and 100- and 400-lb. drums.

VALVOLINE OIL COMPANY

Cincinnati, New York, Chicago, Los Angeles

Manufacturers of the First Pennsylvania Oil

X-18—Made of pure Pennsylvania, and thoroughly tested, X-18 meets or exceeds manufacturers' specifications such as General Motors G.M. 4664M. Replaces Winter and Summer grades of Gear Oils, straight and heavy-duty Passenger Car Hypoid, Truck-Duty Hypoid, Extreme Pressure, Worm and Steering Gear Lubricants.



MAIL THIS COUPON

Valvoline Oil Company, General Offices: 540 E. 5th Street, Cincinnati, Ohio.
Gentlemen: Without obligation I'd like the facts on "X-18."

Name.....

Address..... City..... State.....

Blackhawk Announces New Porto-Power Products

To provide a wider range of utility for Porto-Power, the Blackhawk Mfg. Co., Milwaukee, Wis., introduces a new Ram Kit, Spee-D-Coupler and Duckbill Spreader. The new Ram Kit contains the standard 7 and 20-ton rams in addition to the new 4-ton Midget Ram and Spee-D-Coupler.

With the use of the Spee-D-Coupler,



one pump and hose can be used on the size ram that is necessary to fit a particular job. These couplers can be added to previous models.

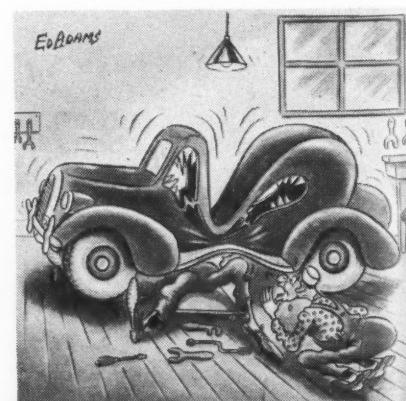
The Duckbill Spreader is designed for body work, one of its uses being to spread out accordion pleats, crushed sections and back panels that have been flattened against the chassis.

Emery Wheel Dresser

Rinck-McIlwaine, Inc., 16 Hudson St., New York City, has a new emery wheel dresser. Designed to keep grinding wheels clean, sharp and true,



the new dresser is said to remove high spots, roughness or packed-in carbon or metal. Overall length 8 in., cutter width $\frac{1}{2}$ in. Price \$60.



"Stop tightening that nut, Sam!"



THIS SEAL
Means Something

TO YOU AND YOUR CUSTOMERS

• You'll find the NAPA seal on more than 50 non-competing automotive lines. At a glance, you'll know that the product bearing it meets the high standard of quality which always has been maintained in every product distributed by the National Automotive Parts Association.

You can obtain these products, for all cars, from one convenient and co-operative source—the NAPA jobber in

your community. Here you'll receive immediate service on all parts you regularly need—exceptionally fast service on seldom-needed parts, made possible by master stocks maintained in 38 NAPA Warehouses strategically located throughout the nation.

Better service, yes. But above all, dependable quality, identified for you and your customers by NAPA's "Assurance of Quality."

NATIONAL AUTOMOTIVE PARTS ASSOCIATION
EXECUTIVE OFFICES: 705 FOX BUILDING, DETROIT

A NATION-WIDE WAREHOUSING AND DISTRIBUTING ORGANIZATION

These are the Products

WHICH CARRY NAPA
"ASSURANCE OF QUALITY"

ALLIED-A P C
Nukrome Valves, Valve Guides,
Pin and Boss Bushings

ALLIED-PRECISION
Piston Pins

ALLIED-RAYMOND
Valve Springs and Keys

ALLIED-WISCONSIN
Pistons, Cylinder Sleeves

AMERICAN BRAKEBLOK
Brake Lining, Clutch Facings,
Fan Belts, Radiator Hose

BALKAMP
Parts for Ford, Chevrolet and Plymouth.
Tie-Rod Ends, Shackles, etc.

BELDEN
Spark Plug Wire and Sets, Primary Wire
and Looms, Battery Cables,
Cordlites and Soldering Irons

BROWN-LIPE
Transmissions and Clutches

BUFFALO—Mufflers and Tail Pipes

CELORON—Timing Gears

DETROIT—Universal Joints

DITTMER—Transmission Gears, Shafts,
and Small Parts

DOUBLE DIAMOND
Drive and Pinion Gears,
Flywheel Gears, Axle Shafts,
Differential Parts

DUCKWORTH—Timing Chains

ECHLIN
Ignition Parts, Coils, Testing Instruments,
Electrical Bushings, Oil Pump and
Igniter Gears

FEDERAL—Ball Bearings

GRAPHO
Water Pumps and Parts, Packing

MARTIN-SENOUR
Spraying Lacquers, Synthetic Enamels,
Painter Specialties, Thinners, Reducers

MONMOUTH
Clutch Plates and Parts,
Engine Bearings, King Bolt Sets

NEW BRITAIN—Automotive Hand Tools

PURITAN
Hydraulic Brake Fluid,
Shock and Knee-Action Oil

RARITAN—Roller Bearings

SPICER—Universal Joints

STANDARD
Oil Seals and Grease Retainers,
Gear Adjustment Shims

TRICO
Vacuum-Operated Safety Products

UNITED
Hydraulic Brake Parts, Brake Cables,
Fuel Pump Parts, Speedometer Cables
and Parts

—AND OTHER PARTS AND MATERIALS

*It pays to buy
the best*

Glycerine to Combat Static Conditions

Static electricity on fan belts of automobiles, refrigeration equipment and the like, aside from its generally dangerous nature and interference with radio reception, is apt to give unpleasant shocks when metal parts are touched. The friction which is the cause of the static electricity, however may be reduced by means of a mixture of glycerine and graphite, applied at the points of friction.

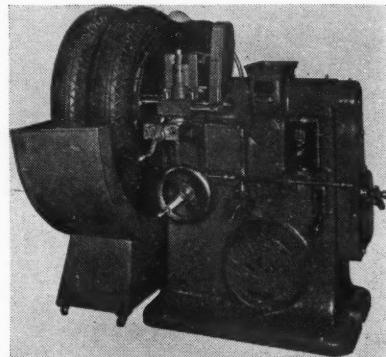
The glycerine-graphite mixture is also an excellent lubricant, valuable not only because it is insoluble in

most organic solvents but also because it retains its activity at very low temperatures and extremes of weather. Being non-toxic, glycerine alone or in combination with graphite, may safely be employed as a lubricant for food-treating equipment.

Wet Grinding Brake Drum Machine

Latest in the field of brake drum reconditioning equipment is the Lempco wet grinding brake drum machine, offered in three different sizes by Lempco Products, Inc., Bedford, Ohio. Advantages claimed for this new

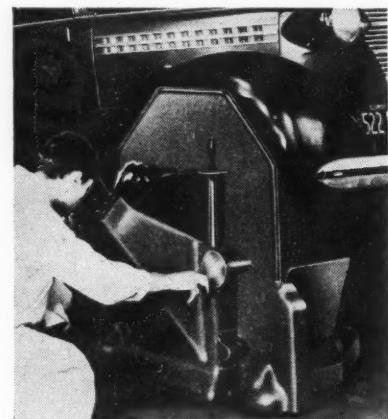
equipment are first, that the liquid coolant eliminates the possibility of drum distortion, and that liquid grind-



ing carries off the grindings and keeps the shop free of abrasive dust. In addition to grinding drums, these machines can also be used on flywheels, clutch pressure plates and other parts of the car.

X-Ray for Tires

A new fluoroscopic device which permits filling station attendants to X-ray automobile tires has been developed by General Electric X-Ray Corp., Schenectady, N. Y. It is called a "Tire-o-scope." It is claimed that, without removing the tire from the



wheel, the operator can look into the tire to detect breaks, bruises, cord separations that are otherwise hidden, and to see such foreign objects as tacks, nails, wire, screws, glass and stones embedded in the casing.



"Boy! I'm glad this is only a cartoon!"

SET NO. 36

"36"

MOVES TRAFFIC THRU YOUR SHOP

WITH its 26 "Super-sockets" and 8 attachments "36" has the working speed TO GET THOSE JOBS OUT. No searching for the right socket, no headaches over the wrong handle! Always handy in the strong steel case are 13 Straight Wall "Supersockets" with 12 pt. openings 7/16 to 1" for all popu-

lar sizes of U.S., S.A.E. and Amer. Std. Nuts and Cap Screws; 5 Extra Deep, 12 pt. openings 11/16 to 1 1/8" for popular spark plugs; 8 Regular, square openings 3/8 to 1/2". And fitting like a glove into 'em are 8 Handles and Parts, including Reversible "Superratchet" and Universal Joint. Ask your jobber — TODAY.

WILLIAMS
SUPERIOR DROP-FORGED TOOLS
"SUPERSOCKETS"

J. H. WILLIAMS & CO., "The Wrench People", 225 Lafayette St., New York
Western Warehouse & Sales Office: Chicago. Works: Buffalo

Now in Full Swing!

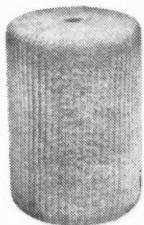


The Biggest SALES DRIVE in Oil Filter History backed by POWERFUL ADVERTISING

If you want to get in on the greatest sales maker the oil filter business has ever seen, now's the time—and AC is delivering the goods!

All you do is sign up,—either special deal or contract,—with your AC wholesaler, as an official AC Oil Filter Service Station.

This campaign is a "natural!" The AC Line covers both market and pocketbook. Demand is established, and growing fast. Take advantage of this tremendous opportunity.



NEW! Low-Priced ARGO Cotton Oil Filter ELEMENTS

For practically all principal makes of filters. Ask your AC Wholesaler about this new line.

Retail—70c and up

**SIGN UP NOW
WITH YOUR AC WHOLESALER
Your material will be rushed
direct from AC**

AC OIL FILTER EQUIPMENT (Standard or Optional)

Buick, Cadillac V-16, Oldsmobile*, and Pontiac* motor cars; GMC Trucks; Greyhound and Flxible buses; Allis-Chalmers, Eagle, Gravelley, and Ready Power tractors; Atlas Imperial and GM diesels; Continental and Gray Marine motors; Marion Shovels; Koehring road machinery; Brown and Sharpe machinery,—these are some of the vehicles, power plants, and machines on which AC Oil Filters are used for equipment.

*The market for AC Oil Filters and Elements is
BIG—GROWING—AND PROFITABLE*

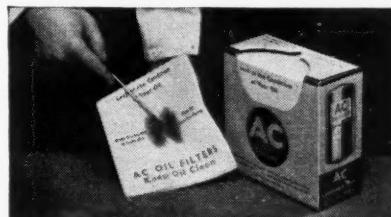
*Optional

AC SPARK PLUG DIVISION • General Motors Corporation • FLINT, MICHIGAN

Here's What You Get—

Hard-Hitting, Consistent Advertising—

the biggest program in AC history. Eye-catching, sales-making ads—in 2 colors—in Saturday Evening Post, Collier's, Country Gentleman—with more than 20 million readers.



FREE "Oil Test Pads"—to start the sale

For wiping the dip stick. The dark smear plainly shows the need for a new element or filter.



FREE Window Advertising— Posters and stickers.



FREE Handout Folders —That sell the value and economy of filters.

FREE Identification Sign—

now a feature
of AC national
oil filter adver-
tising.



FREE Installation Instruction Manual—

will be kept up to date for official
AC Oil Filter Stations only.

Mays Sets New Mile Track Record

Roaring around the Milwaukee State Fair park oval at an average speed of 94.5 m.p.h., Rex Mays set a new world's one-mile dirt track record at the AAA race on June 10. Mays circled the track in 37.78 seconds to eclipse the mark set at Springfield, Ill., in 1938 by George Connor of San Bernardino, Cal.

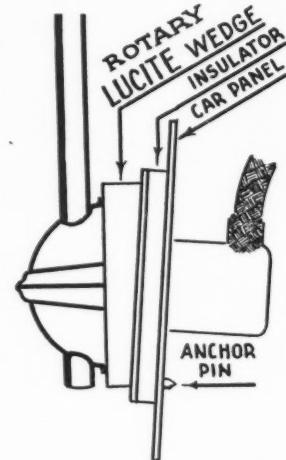
An unusual incident occurring the same day found Walter Lager, who got into one of the 10 mile heats unintentionally, unhurt when his car smashed into a retaining wall. Lager, head mechanic for William Corley of

Chicago, owner of a car which was to have been driven by Billy DeVore, took the car out on the truck to warm it up for DeVore. Officials, thinking it was a time trial, clocked him at 43:07 and then ordered him to drive in the 10 mile event.

and fine wire which is best adapted to work on aluminum, brass, molds, auto body work, buffing and finishing.

Radio Aerial Has New Mounting

The latest product of Burton-Rogers Co., 857 Boylston St. Boston, Mass., is an automobile radio aerial with a special mounting. One hole required in the panel, plus a small hole for the anchor pin. Special wedge shaped Lucite piece may be rotated on the mounting, insuring a vertical position



of the aerial regardless of the slope of the cowl panel. Aerial has solid brass base fitting and stiff oversize telescoping tubes to prevent whipping.

Do-Ray Sealed Beam Driving Light

A new driving and passing lamp, using the latest type GE sealed beam lighting unit, is announced by the Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago, Ill. Lamp housing is of heavy chrome-plated brass with malleable iron bracket for strength. Body is 6½ in. in diameter, attractive new door styling to harmonize with present headlamps. The new series 600 driving and passing lamp may be obtained in pairs, with one passing and one driving beam, or singly, with either passing or driving beam.

Short Type Box Wrench

For working in cramped quarters and with low overhead clearances, Bonney Forge & Tool Works, Allentown, Pa., offers a new 15 deg. angle wrench. Handles are thin and oval-shaped, affording a firm comfortable grip. They have double hexagon openings, are fully chrome plated and have polished heads, thin wall. These new wrenches are made in three sizes with the following openings and lengths: ¾-in. and 7/16-in. openings, 4 ½ in. long; 7/16-in. and ½-in. openings, 5 in. long; ½-in. and 9/16-in. openings, 5 ½ in. long.

Announcing!

**OUR NEW
1941
HEATER SWITCHES**

**BE SURE AND BUY
THESE BEAUTIFUL
NEW HEATER SWITCHES
RECOGNIZED FOR
THEIR PERFORMANCE
AND
OUTSTANDING SALES APPEAL**

Cole-Hersee products are used by leading car manufacturers as original equipment.

COLE-HERSEE COMPANY

54 Old Colony Avenue Boston, Mass.

Rep.—Eastern Canada-Ontario-Quebec-Maritimes.
S. F. BACHER & CO., 310 Spadina Ave., Toronto, Ont.

**OUR NEW
1941
CATALOG
IS NOW
ON PRESS**

- ADVISE HOW MANY COPIES YOU NEED FOR YOUR COUNTERS AND SALES MEN

MEMA
MOTOR EQUIPMENT
MANUFACTURERS
ASSOCIATION

SEND FOR CATALOG
or any other
information
to Dept. A-7

AIR COMPRESSOR

SERVICE

as near as your telephone

WHEREVER you are, there's a Wayne direct factory-trained service man with a complete stock of parts near you. If you need air—you need it all the time. That's why Wayne is the safest air compressor buy in the world—no other manufacturer offers anything like the service facilities of The Wayne Pump Company—with service at 250 points in the U. S. A. alone. Big value—tested efficiencies higher than average, assuring low power cost—longer life—low prices—easy terms. Write today for bulletin.

THE WAYNE PUMP COMPANY
DEPT. MA-740 FORT WAYNE, INDIANA

TERMS AS LOW AS \$5.00 DOWN—\$5.00 PER MONTH

"Certified for Safety"
This Tag Means Easier Selling



**Sell Certified
DO-RAY Lighting**



• Your customers want the extra protection of devices that are Certified by this tag. It identifies Do-Ray fog lights, stop lights, and other products. They're Certified for safety. Sell Do-Ray and you'll sell more.

Do-Ray devices are tested by recognized independent laboratories and pass S.A.E. and I.E.S. specifications. They are certified to meet all requirements of the Interstate Commerce Commission. Your customers know these devices are SAFE for heavy duty truck and bus service.

Only Do-Ray products are Certified for safety. Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago, Ill., U.S.A.

You're Sure of More Sales with

DO-RAY

Tiger-Ey-Nobby
and Reflecting Devices
Ask Your Jobber

SAFETY LIGHTING

No. 1122 Do-Ray Nobby Clearance Reflex Signal
for heavy duty vehicles. 42" dia. 31.00
List price 35.00

No. 1123 Flush Type Clearance Lamp. 42" dia.
List price 32.00

No. 1122B Flexible 3-way light. One piece
rubber body. fits any surface.
List price 20.00

No. 1134 Do-Ray Sure-Bac Flexible All
Rubber Clearance Lamp. Angle Bracket
List price 20.00



**Clean BODY LUBRICATION
WITH DOOR-EASE**

• Body lubrication is an essential feature of every thorough lubrication job... and it makes a hit when customers see that you use DOOR-EASE Products for this purpose. DOOR-EASE lubricates without danger of soiling clothing or car upholstery.

Use DOOR-EASE Stainless Stick Lubricant as specified by leaders in the industry for door dovetails, lock tongues, rubber door bumpers, hood lacings and other exposed surfaces. Use DOOR-EASE Dripless Oil, a rapid penetrant and better lubricant for hinges, locks and other hard-to-get-at places. "Runs in — Won't run out".

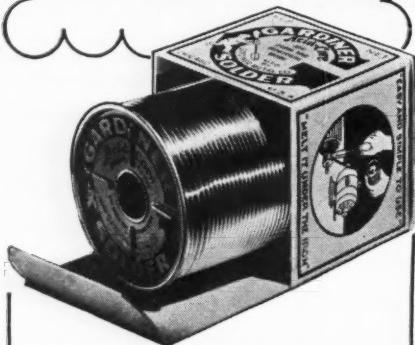


... by the makers of
RUGLYDE Penetrating
Rubber Lubricant.



**AMERICAN GREASE STICK CO.
MUSKEGON, MICH.**

Sets the Pace
FOR QUALITY
and ECONOMY



The quick-acting flux of Gardiner Acid-Core Solder permits exceptionally fast, clean work. Unusually high tensile strength insures lasting bonds. Yet, thanks to modern methods exclusive with Gardiner, these better solders are low in first cost and most economical to use. Other Gardiner products famous throughout the automotive industry for top performance and bottom cost are Solid Wire, Bar and Body Solders . . . and Permanent Lining Babbitt metal.



4839 S. Campbell Ave., Chicago, Ill.

Don't Pay More!



Don't Accept Less

Valley Battery Chargers quickly repay their low first cost in added profits to your shop. Guaranteed for two years.

Model G-12 charges 1 to 12 6-volt batteries.

NOW ONLY \$25.00

Other sizes at equally low prices. Write for FREE bulletin.



Valley Electric Corp.

4221 Forest Park Blvd. • St. Louis, Mo.

THE ONLY

burn-out PROOF

DIRECTIONAL SIGNAL SWITCH

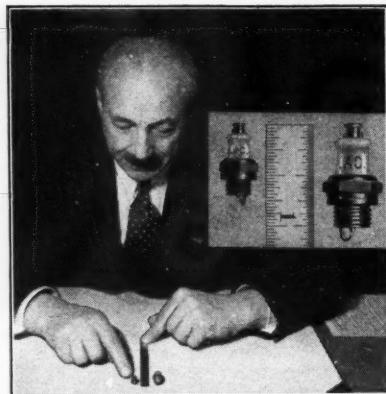
PAT. PEND.

No competition, no sales resistance! Every day more fleet operators are installing this better switch as replacements with present make of signals or with complete sets of Signal-Stats. Be ready to meet this demand.

SIGNAL-STAT CORPORATION
59-79 PEARL STREET
BROOKLYN, N. Y.

Advertised in Commercial Car Journal & Fleet Owner

Unconditionally GUARANTEED!



Hector Rabezzana, chief engineer of AC Spark Plug, compares the new model airplane engine spark plug, the company is manufacturing, with the former size. The new plug is only $\frac{3}{4}$ in. long, and has a thread size of $\frac{1}{4}$ in.

Oil Filter Package

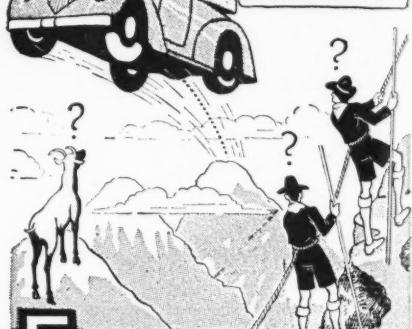
The Pick Honey replaceable cartridge type oil filter announced a few months ago is now available in package form. The package consists of the oil filter, all fittings, flexible hose lines, motor mounting brackets and



complete installation instructions. A special package identified as No. P3H1 is designed for installation on Ford V-8 cars from 1932 to 1940, Lincoln-Zephyr 1937 to 1940 or Mercury 1939-1940. Package No. P3H3 takes care of Olds and Pontiac, while package No. P3HU is intended for universal installation on cars, trucks, tractors and motorized equipment. Package No. P3H1, P3H2 and P3H3 list at \$5.50; P3HU list at \$6.00. Pick Mfg. Co., Weat Bend, Wisconsin.

Follow THE PREDICAMENTS OF CHARLOTTE SOUTHERN (WOMAN DRIVER)

-BUT I'M SAFER THAN YOU ARE - I'VE GOT
SOUTHERN BRAKE LINING



SOUTHERN
FRICTION MATERIALS CO. CHARLOTTE, N.C.

For running-in new and rebuilt engines use auxiliary lubricants containing "dag" * Brand colloidal graphite.

Acheson Colloids Corporation

Port Huron Michigan

*REG. U. S. PAT. OFF.

See it! Try it!



WARNER
PORTABLE MOTOR ANALYZER
WARNER-PATTERSON COMPANY
920 S. Michigan Avenue, Chicago, Illinois

TRADE MARK
NOC-OUT
HOSE CLAMPS
WITH THE THUMB SCREW



For fast, dependable hose connections, use NOC-OUT Hose Clamps . . . standard in the automotive industry for many years for their leakproof, trouble-free sealing features. Quick tightening thumb screw provides equal pressure all around. Type "A" Adjustable . . . fits many hose sizes. Type GBB heavy duty, solid band for Booster Brakes. Type HP for all high pressure air and gas lines.

Sold by dealers and jobbers everywhere.

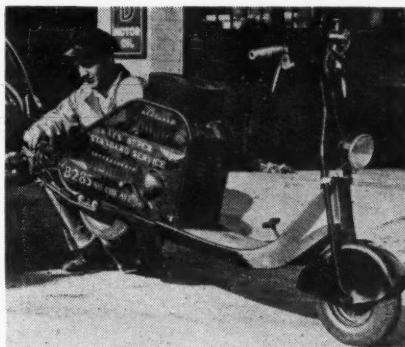
WITTEK MFG. CO.
4305 W. 24th PL., CHICAGO, U.S.A.

BLUE CROWN
SPARK PLUGS

AIR COOLED
LARGE ELECTRODES GIVE LONGER LIFE

FINNED SHELL
SAVES GAS

Ask your Jobber
MOTOR MASTER PRODUCTS CORPORATION
4757 Ravenswood Ave., Chicago, U.S.A.
Export Distribution
BORG-WARNER INTERNATIONAL CORP., Chicago



Kay Super Standard Service of Chicago uses this Moto-Scoot equipped with tow-bar for pick up and delivery of 75 cent wash and grease jobs—and make a profit on it. Kay's says that the increase of business in the first thirty days has more than paid for the Moto-Scoot which travels up to 120 miles per gallon of gasoline and at speeds up to 35 m.p.h.

Fuel Line Assortment

The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill., has announced a new merchandising unit containing 21 flexible gas, oil and grease lines covering replacement requirements of approximately 85 per



cent of the cars on the road. Included also is a wall chart showing the application of the lines in the assortment. The complete assortment and merchandiser has a dealer list of \$7.85.

Correction

A news item in the June issue of MOTOR AGE concerning the introduction of a letter-opener and magnifying glass by K-D Manufacturing Co. was so worded that our readers may have misunderstood and assumed that K-D had ceased to manufacture its regular line of automotive tools. To keep you straight, K-D is still actively producing its regular automotive line and will continue to do so.

The combined letter-opener and magnifying glass has a keen blade with a 2½-in. precision lens in the handle, focussed to give maximum magnification when laid flat on print. The width of the lens permits reading a full column-width of type in any telephone book. Its overall length is 9 in., and it is packed in a gift box; supplied either in solid bronze, statuary bronze or chromium. For further details write K-D Mfg. Co., Lancaster, Pa.

YOU CAN BUY A HIGH QUALITY
"KING" BATTERY CHARGER

for \$
only 25 00
LESS TUBE

Here is an efficient and dependable charger at a bargain price. It has an all welded heavy steel case that is finished with acid-resisting material. The ammeter is of rugged design to withstand overloads, and the transformer is of high quality. A large number of transformer taps permit setting to desired rate with but one adjusting knob. Adjusting knob is made of molded bakelite, and the rheostat has the exclusive "KING" method of making contact with a spring laminated phosphor bronze lever. The Special-12 will charge from one to twelve 6-volt batteries at a 6-ampere rate. We make a complete line of Battery Chargers, Testers and Charging Racks.



"KING" Special-12

new "KING"
ARMATURE TESTER Indicates
"SHORT" and "GROUND"

The "KING" KA-4 Armature Tester has two meters, one to indicate "shorts" and one to indicate "grounds." A 110-volt circuit is usually used for making ground tests, but quite often an armature is passed as good and later develops trouble when put back in service. This is due to lack of voltage and to overcome it we have incorporated a step-up transformer which develops sufficient voltage to positively indicate on the meter if armature is grounded. Often a slight ground can be "burned out," thereby correcting the fault. Every shop should have this new "KING" Armature Tester because it will save a lot of "grief."



"KING" WELDERS
WILL EARN YOU MONEY

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Schrader Has New Inner Dual Valve Cap

Announcement of a new heavy-duty valve cap built especially for the inner dual tire has been made by A. Schrader's Son, 470 Vanderbilt Ave., Brooklyn, N. Y. This cap, known as No. 440, is guaranteed by the manufacturer to be air-tight up to 250 lb., and has a special heat-resisting washer. At the same time the company announces a special socket wrench which will hold all types of standard valve caps and make it easy to apply them to the "hard to reach" inner dual tires.

Du Pont Offers Refinish Book

A complete resume of automotive finishing has recently been issued by the finishes division of E. I. du Pont de Nemours & Co. A 30-page booklet entitled "Instructions for Using du Pont Refinishing Materials," relates, from a practical point of view, the systems recommended by their chemists as being the most satisfactory for finishing the various types of surfaces encountered in the automotive field.

The first section, entitled "Procedures," deals with the methods of performing the various painting operations. The subjects discussed in detail begin with the preparation or removal of the old finish and continue with each step in the refinishing procedure until the job is completed.

The second division contains descriptions of du Pont refinishing Materials. All products are described in

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regard to their uses and applications. As the correct application of finishes is of vital importance to the results obtained, the proper method of mixing and applying each item is clearly defined.

The third section consists of step-by-step outlines in the various operations in the different type jobs, ranging from complete refinishing to touch-up work.

The final section of the booklet is devoted almost entirely to paint difficulties, their causes and cures.

A free copy of the new and comprehensive "Instructions for Using du Pont Refinishing Materials" booklet may be obtained by writing to E. I. du Pont de Nemours & Company, Inc., Room 7156, Wilmington, Del.

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